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THE
CYCLOPÆDIA;
OR,
Universal Dictionary
OF
ARTS, SCIENCES, AND LITERATURE.

VOL. XXVI.

THE HISTORY OF THE

ROYAL SOCIETY

OF GREAT BRITAIN

THE
CYCLOPÆDIA;

OR,

UNIVERSAL DICTIONARY

OF

Arts, Sciences, and Literature.

BY

ABRAHAM REES, D.D. F.R.S. F.L.S. *S. Amer. Soc.*

WITH THE ASSISTANCE OF

EMINENT PROFESSIONAL GENTLEMEN.

ILLUSTRATED WITH NUMEROUS ENGRAVINGS,

BY THE MOST DISTINGUISHED ARTISTS.

IN THIRTY-NINE VOLUMES.

VOL. XXVI.

LONDON:

PRINTED FOR LONGMAN, HURST, REES, ORME, & BROWN, PATERNOSTER-ROW,
F. C. AND J. RIVINGTON, A. STRAHAN, PAYNE AND FOSS, SCATCHERD AND LETTERMAN, J. CUTHELL,
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CYCLOPÆDIA:

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OF

ARTS and SCIENCES.

P

P A A

P, A labial consonant, formed by a slight compression of the anterior part of the lips, and retaining an uniform sound, and the fifteenth letter in the English alphabet.

When the P is followed with an H in the same word, it has the sound of an F; thus Philosophy is pronounced Filofophy: and this is generally the case in words derived from the Greek.

P and B are so like each other, that Quintilian declares, that in the word *obtinuit*, his reason required him to put a *b*, but that his ears could hear nothing but a *p*, *optinuit*: hence in ancient inscriptions, and old glossaries, it appears, that these two letters have often been confounded.

Several nations still pronounce one for the other, the Welsh and Germans particularly, who say, *ponum vinum* for *bonum vinum*.

Plutarch observes, it was usual for those of Delphi to say *βάλειν* for *πάλειν*, *βίκαρον* for *πίκαρον*; and among the Latins, as often as an *s* followed, the *b* was changed into a *p*, as *scribo*, *scripsi*.

P is sometimes mute before *t*, as *accompt*; but in modern orthography it is usually omitted.

P, in *Music*, is the initial of *piano*, soft, for which it stands; and *pp*, by abridgment, for *pianissimo*, very soft.

P. M. among *Astronomers*, is frequently used for *post meridiem*, or *afternoon*; and sometimes for *post mane*, *after the morning*, i. e. *after midnight*.

P was also used among the ancients as a numeral letter, signifying the same with the G, viz. a hundred; according to the verse of Uguccio.

“P similem cum G numerum monstratur habere.”

Though Baronius thinks, it rather stood for seven.

When a dash was added a-top of P̄, it stood for four hundred thousand.

St. Jerom observes, on Daniel, that the Hebrews had no P; but that the *ph* served them instead of it; adding,
VOL. XXVI.

that there is but one word in the whole bible read with a P, viz. *apadno*.

The Greek π signified 80. The Latins used P as an abbreviature. Thus P. stood for Publius, pondo, &c. in S. P. Q. R. or Senatus populusque Romanus, for populus; R. P. denoted respublica; P. C. patres conscripti; PR. S. prætoris sententia, &c. On the French coins, P denotes those that were struck at Dijon.

P. in *Medicinal Prescription*, is used for *pugil*, or the eighth part of a handful.

P. Æ signifies *paries æquales*, equal parts of any ingredient: otherwise denoted by *ā* or *anā*.

P P. signify *pulvis patrum*, i. e. Jesuit's powder, or the cortex Peruvianus in powder; which is so called, because first brought into Europe by those fathers; and *p. p. t. præparatus*, prepared.

PAA, in *Geography*, a town of Thibet, 450 miles E. of Lassa. N. lat. 28° 18'. E. long. 98° 34'.

PAA, a town of the island of Ceram, and capital of a district abounding in sago.

PAAKOLA, a town of Sweden, in the government of Ulea; six miles N. of Kemi.

PAALAVANKA, a town of Hindoostan, in Golconda; 30 miles N.W. of Damapetta.

PAARDEBERG, or the *Horse Mountain*, so called from the number of wild horses or zebras, that formerly frequented it, a mountain of the Drakenstein district, in Southern Africa, which is a continuation of Paarl mountain to the northward. The produce of the farms is chiefly confined to wheat, which, with a sprinkling of manure, or a couple of years' rest, or by fallowing, will yield from 15 to 20 fold. They cultivate, also, barley and pulse, but have few horses or cattle beyond what is necessary for the purposes of husbandry.

PAARL, a village in the district of Drakenstein, in Southern Africa, situated at the foot of a hill that shuts in

B

the

the valley of Drakenstein on the west side. It consists of about 30 habitations, disposed in a line, but so far detached from each other, with intermediate orchards, gardens, and vineyards, as to form a street from half a mile to a mile in length. About the middle of this street, on the east side, stands the church, a neat octagonal building, covered with thatch; and at the upper end is a parsonage-house, with garden, vineyard, and fruit groves; and a large tract of very fine land. The village is overhung by blocks of granite, the pearl, and the diamond. Barrow's Africa, vol. ii.

PAATIS, a town of Sweden, in the government of Abo; 10 miles N. of Abo.

PAATPASSER, a small cirar of Bengal, watered by the Ganges, between Dacca and Boofnah.

PAAVOLA, a town of Sweden, in the government of Ulea; 20 miles E. of Brahested.

PAAW, PETER, in *Biography*, a physician and anatomist, was born at Amsterdam in 1564. When he had finished his scholastic education, he was sent to Leyden at the age of sixteen, where he attended the medical courses for the space of four years, and thence proceeded to Paris for farther improvement. He afterwards commenced his travels for the purpose of visiting other celebrated schools; and after spending some time in Denmark, and at Rostock, where he received the degree of doctor in 1587, he repaired to Padua, and attended the dissections of Fabricius ab Aquapendente. Paaw was naturally of a grave and serious disposition, and possessed an acute and retentive memory, and was therefore well able to profit by these advantages of education; and accordingly his great acquirements were soon acknowledged, on his return to Leyden, by an appointment to a medical professorship in that university in 1589. His whole ambition was centered in the prospect of supporting the dignity and utility of this professorship, and he obtained the approbation and esteem both of the public and his colleagues. He died, universally regretted, in August 1617, at the age of fifty-four. Anatomy and botany were the departments which he most ardently cultivated, and Leyden owes to him the establishment of its botanic garden.

Paaw left the following works: 1. "Tractatus de Exercitiis, Laeticiis, et Bellariis." Rost. 2. "Notæ in Galenum, de cibis boni et mali fucci," *ibid.* These two pieces appear to have been his inaugural exercises. 3. "Hortus publicus Academicæ Lugduno-Batavæ, ejus Ichnographia, descriptio, usus, &c." Lugd. Bat. 1601. 4. "Primitiæ Anatomicæ de humani corporis ossibus," *ibid.* 1615. 5. "Succenturiatus Anatomicus, continens Commentaria in Hippocratem de Capitis Vulneribus. Additæ sunt Annotationes in aliquot Capita Libri 8vi. C. Celsi," *ibid.* 1616. 6. "Notæ et Commentarii in Epitomen Anatomicum Andree Vesalii," *ibid.* 1616. The following appeared after his death: 7. "De Valvulâ Intestini Epistolæ duæ," Oppenheim, 1619, together with the first century of the Epistles of Fabricius Hildanus. 8. "De Peste Tractatus, cum Henrici Florentii additamentis." Lug. Bat. 1636. 9. "Anatomicæ Observationes selectiores." Hafniæ, 1657, inserted in the third and fourth centuries of the anatomical and medical histories of T. Bartholin. He also left in MS. a "Methodus Anatomica," which was in the library of M. de Vick of Amsterdam. Eloy Dict. Hist. de la Med.

PABBAY, or PAPAY, in *Geography*, one of the Bishop's islands, among the Hebrides. N. lat. 56° 50'. W. long. 7° 32'.—Also, one of the small Hebrides, near the W. coast of Lewis. N. lat. 58° 11'. W. long. 6° 59'.—Also, one of the western islands of Scotland, about nine miles in circumference, and five miles N. from North Uist. N. lat. 57° 55'. W. long. 7° 12'.

PABIANICE, a town of the duchy of Warsaw; 32 miles E.N.E. of Siradia.

PABLO, ST., a lake in the jurisdiction of Otabalo, in the province of Quito, three leagues in length, and about half a league broad. Its waters are discharged into Rio Blanco.—Also, a town of Mexico, in New Navarre; 170 miles W. of Casa Grande.—Also, a town of New Mexico; 70 miles E. of Sumas.—Also, a town of South America, in the province of Moxas; 140 miles N.W. of Trinidad.—Also, a town of Mexico, in the province of New Biscay; 130 miles S.W. of Pairal.—Also, a town of Mexico, in the province of Veraguas; 22 miles S.W. of Remedios.

PABNEIKIRCHEN, a town of Austria; four miles N.W. of Grein.

PABO, in *Biography*, a British prince and warrior, who flourished in the fifth century, was defeated and sought refuge in Wales, where he was hospitably entertained by the king, who gave him lands. From the army he entered into the church, and by his devotions acquired the character and title of a saint. He founded a church in Mona, Anglesea, where his monument with an inscription is said still to exist. Owen's Camb. Biog.

PABOON, in *Geography*, an island of Africa, in the river Gambia, nine miles long, belonging to the kingdom of Yani.

PABOS, in *Botany*. See CAAMINI.

PABOU, in *Geography*, a town of Canada, on the N. coast of Chaleur bay; 20 miles S.W. of cape Goope.

PABULUM is sometimes used among naturalists for fuel, or that part in combustible bodies which the fire immediately feeds on, or is supported by.

PABULUM of Plants, in *Agriculture*, a term applied to that substance which nourishes them. See FOOD of PLANTS.

PACA, the Spotted Cavy, in *Zoology*. See CAVIA Paca.

PACAJES, or PACAXES, in *Geography*, a town of Peru, and capital of a jurisdiction in the diocese of La Paz, containing some rich silver mines, which are not much wrought. Here are also emeralds. The air is variable, sometimes cold, sometimes hot, and occasionally temperate. The pastures are good: and its principal source of commerce and wealth is cattle; 80 miles S.W. of La Paz.

PACALIA, a feast held among the ancient Romans, in honour of the goddess Pax, Peace.

Alnhelmus, de Laud. Virgin. speaking of the impure festivals and ceremonies of the heathens, calls one of them *Panalia*; which passage Gronovius charges as faulty, alleging, that there was no feast of that name, but that it should have been *Pacalia*, or perhaps *Palilia*.

The ancients, who personified, and even deified every thing, were not forgetful of Peace: she had an altar at Rome, and a stately temple; and religious rites were paid her with great solemnity.

PACAMARES, in *Geography*, a district of Peru, where the air is temperate, and which is said to abound with gold.—Also, an Indian nation occupying the banks of Amazon river.

PACATIANUS, TITUS JULIUS MARINUS, in *Biography*, an usurper, who excited the Gauls to revolt in his favour, in the reign of the emperor Philip; but he was defeated and put to death in the year 249 by the troops which raised Decius to the throne. There are medals of Pacatianus still existing. Moreri.

PACATUS, LATINUS DREPANIUS, who flourished in the fourth century, was a native of Drepanum, in Aquitania, and celebrated as a poet and orator. He was in habits of intimacy with Ausonius, who consulted him on his own writings, and has addressed several pieces to him.

When

When Theodosius the Great visited Rome in the year 388, after the defeat of Maximus, Pacatus was deputed from Gaul to congratulate him on his victory. On this occasion he pronounced a panegyric oration before the emperor and senate, which is extant, and in the course of which he said, if the elder Brutus could be permitted to revisit the earth, the stern republican would abjure, at the feet of Theodosius, his hatred of kings, and ingenuously confess that such a monarch was the most faithful guardian of the happiness and dignity of the Roman people. "Yet," says the historian of Rome, "the piercing eye of the founder of the republic must have discerned two essential imperfections, which might, perhaps, have abated his recent love of despotism. The virtuous mind of Theodosius was often relaxed by indolence, and it was sometimes inflamed by passion:" see THEODOSIUS. Pacatus was afterwards created a proconsul, and in 393 was appointed superintendent of the imperial domain. The orator Symmachus addressed several letters to him, and Sidonius Apollinaris mentioned him with applause. He was probably a Pagan. None of his poems remain: his panegyric on Theodosius was printed in 1651, separately, and it is contained in the "Panegyrici Veteres." It is reckoned eloquent for the age in which it was written, "more characterized by force of expression and imagination than by taste and purity of style, and, in its best passages, bearing some resemblance to the manner of Tacitus." Moreri. Gibbon.

PACAUDIE'RE, LA, in *Geography*, a town of France, in the department of the Loire, and chief place of a canton, in the district of Roanne; 12 miles N.W. of Roanne. The place contains 1426, and the canton 7326 inhabitants, on a territory of 245 kilometres, in eight communes.

PACCHIEROTTI, GASPARO, in *Biography*, one of the most scientific, expressive, and finished singers, which Italy ever produced, was born in the Roman state, and began his career in 1770, at Palermo in Sicily, where he continued during 1771. In 1772, he was the principal singer in the great theatre of San Carlo at Naples, with the De Amicis. In 1773, at Bologna; in 1774, at Naples again. In 1775, at Milan, with the Taiber; in 1776, at Forli; in 1777, at Genoa and Milan; and in 1778, at Lucca and Turin, previously to his arrival in England, where his reputation had penetrated a considerable time, and where signor Piozzi, who had heard him at Milan, sung several airs after his manner, in a style that excited great ideas of his pathetic powers. The travels of captain Brydone had likewise contributed to raise public expectation; indeed our own was excited so much, that we eagerly attended the first general rehearsal, in which, though he sung *sotto voce*, under a bad cold in extreme severe weather, and did not seem to exert himself, our pleasure was such as we had never before experienced. The natural tone of his voice was so interesting, sweet, and pathetic, that when he had a *mezza di voce*, or long note to swell, we never wished him to change it, or to do any thing but swell, diminish, or prolong it in whatever way he pleased, to the utmost limits of his lungs. A great compass of voice downwards, with an ascent up to B b, and sometimes to C in alt, with an unbounded fancy, and a power not only of executing the most refined and difficult passages of other singers, but of inventing new embellishments, which, as far as our musical reading and experience extended, had never then been on paper, made him, during his long residence here, a new singer every time we heard him. If the different degrees of sweetness in musical tones to the ear might be compared to the effects of different flavours on the palate, it would perhaps convey our idea of its perfection, by saying that it is as superior to

the generality of vocal sweetness, as that of the pine apple is, not only to other fruits, but to figar or treacle. Many voices, though clear and well in tune, are yet insipid and uninteresting, for want of piquancy and flavour. The voice of Pacchierotti, when at its best, was the *dolce piccante*. A more perfect shake on short notice, and in every degree of velocity, we never heard. His execution of rapid divisions was so true and distinct, that, with a loud and vulgar-toned voice, he would have been admired as a bravura singer; but the natural tone, and, if we may so call it, sentimental expression and character of his voice, is such, as to make many hearers lament his condescending to rival the lark, or ever, even in pathetic songs, quitting simplicity in order to change or embellish a passage in the most new, artful, or ingenious manner possible. But to lovers and judges of music, who constantly attend the opera, it seems desirable that the performers, during the run of a musical drama, should have the power of stimulating attention to an air often repeated, by a variety of new graces and ornaments, which, in some measure, renovate a song every time it is performed; yet, though Pacchierotti possessed this power far beyond any singer we had heard, the public, frequently poisoned by the shafts of envious professors, and perhaps dilettante, was always more inclined to censure than duly commend this talent; for which we can no otherways account, unless this seeming injustice still proceeded from the wishes of an audience to hear more of the sweet tones of his natural voice, undisturbed by art or science.

That Pacchierotti's feeling and sensibility are uncommon, is not only discoverable by his voice and performance, but countenance, in which, through a benign and benevolent general expression, there is a constant play of features, which manifests the sudden workings and agitations of his soul. He is an enthusiast in his art, and feels the merit of a composition and performance with true Italian energy. Nice and fastidious in criticising himself, he consequently does not gratify frivolous and doubtful claims upon his admiration or applause; but to real and intrinsic merit, we never met with more candour, or heard more judicious and zealous panegyric bestowed from one professor to another.

To hearers not accustomed to the refinements of singing, his extemporaneous flights and divisions were so new, that they at first were doubtful whether to blame or commend. But as the true criterion of merit in the arts, is to improve on examination, all persons of knowledge and feeling constantly experienced increasing pleasure at each performance, however frequent the opportunities may have been of gratifying their wish to hear him.

He is not gifted with a very robust constitution, nor was his chest proof against the rude and sudden attacks of our climate; so that though he was never obliged by indisposition to be absent from the stage when his duty called him thither, above once or twice during four years residence among us, yet his voice was sometimes affected by slight colds, from which the stoutest natives are not exempt; but when he was quite in order and obedient to his will, there was a perfection so exquisite in tone, taste, knowledge, sensibility, and expression, that our conceptions in the art could not imagine it possible to be surpassed.

The low notes of his voice were so full and flexible, that in private, among his particular friends and admirers, we have often heard him sing Anani's and David's tenor songs in their original pitch, in a most perfect and admirable manner, going down sometimes as low as B b on the second line in the base.

It appears that in his youth, when his chest was strong, while stimulated by a love of perfection and a determination

to execute every conquerable difficulty, he studied with such unremitting diligence and assiduity as have enabled him to execute, at sight, in all clefs, and in every style of composition, the most difficult songs that have been composed, with such facility, precision, and expression, as if he had long perused and prepared them for public performance. This we have often seen him do in original scores, that it was impossible for him ever to have seen before. He was the only modern singer that of late years we had found able to enter into the style of composers and performers of past times; but being an excellent mimic, he seems never to have heard a singer of great abilities without remembering the particular traits, inflexions, tone of voice, and expressions, which rendered him or her famous. Though he seemed to have a particular zeal for the success of his friend Bertoni's composition at the opera; yet we never perceived a want of ardour in his performance of Sacchini's music, particularly in "Rinaldo," where he sung with as much energy, taste, and expression, as ever it was possible for him to manifest on any occasion. And in concerts he treated the audience with a greater variety of matters, in the songs he selected, than any singer of our time had ever done. At the Haymarket he was usually obliged to lower his performance, particularly duets, to the level of a first woman of very moderate abilities: we except madame Le Brun, who was however so cold and instrumental in her manner of singing, that they did not well accord together. We know there were many frequenters of concerts, who called themselves lovers of music and judges of singing, and yet disliked both his voice and manner, and did not scruple to say, that he had never sung a note in tune during his residence in this country; which was such an insult upon the ears and feelings of his admirers, that they, in revenge, flatly denied their claims to superior knowledge, taste, or experience in such matters.

Almost every great singer unites himself in interest and friendship with some particular composer, who writes to his peculiar compass of voice, talents, and style of singing. Thus Manzoli and Pescetti, Guarducci and Sacchini, Millico and Gluck, the Agujari and Colla, and Pacchierotti and Bertoni, were closely connected.

In the summer of 1779, Pacchierotti returned to Italy for a year, when he was succeeded by Roncaglio, but returned again in 1780, and remained here till after the Commemoration, in 1784.

The airs in which the natural sweetness of his voice, taste, expression, and general powers of pleasing, seem to have made the deepest impression, were, "Misero pargolletto," by Monza, in Demosonte; "Non temer," by Bertoni, in the same opera; "Dolce speme," by Sacchini, in Rinaldo; and "Ti seguirò fedele," in Olimpiade, by Paisiello.

After retiring from England, Pacchierotti seldom sung in public, except at Venice, in which state, at Padua, he established himself in an elegant house, wholly fitted up with English furniture, and an excellent library of well-chosen English books, of which he was very fond, and was able to read with fluency and taste.

During the Revolution he was much harassed and plundered both by the French and Austrians; and, we fear, was a great loser by the breaking of the bank of Venice, and by other failures where he had invested or lent his property. He is, however, said still to retain the low notes of his voice, which is sunk into a full and rich counter-tenor, and in which he still sings to his friends with more strength and firmness than ever.

PACCHIONI, ANTONIO, a learned physician and ana-

tomist, was born at Reggio in 1664. His early education he obtained in his native place, but he repaired to Rome for the purpose of completing his medical studies, and attended the celebrated Malpighi, who subsequently introduced him into practice at Tivoli, where he resided six years, and obtained considerable reputation. He was therefore invited to return to Rome, where he obtained the friendship of Lancisi, who united him as an associate with himself in the work which he was prosecuting, an explanation of the plates of Eustachius. Pacchioni, from his connection with these two able anatomists, was led into similar pursuits, and now devoted himself to anatomical researches, occupying much of his time in dissection, particularly in the examination of the membranes of the brain. His first work, which obtained some temporary celebrity, was entitled "De Duræ Matris Fabricâ et Usu Disquisitio Anatomica," Romæ, 1701; but his observations were not confirmed by other anatomists. In this treatise, he advanced an opinion concerning the muscular and contractile nature of the dura mater, which he supposed, by means of its connection with the tentoria, to act by alternate compression upon the brain and cerebellum. This doctrine, however, was confuted by Bagliu Fantoni, and some other anatomists. His second publication was upon a similar subject, and entitled "Dissertatio Epistolaris de Glandulis conglobatis Duræ Meningis humanæ, indeque ortis Lymphaticis ad Piam Meningem productis, ad clariss. Virum Lucam Schroœckium," Romæ, 1705. The asserted discovery of glands in the neighbourhood of the longitudinal sinus, involved him in controversies with other anatomists, which produced other publications of his own. In his "Dissertationes binæ ad spectatissimum Virum Joannem Fantonium datæ, &c." Rome, 1713, he defended this hypothesis of the glandular structure of those parts; and in his "Dissertationes Physico-Anatomicæ de Dura Meninge humana, novis experimentis et lucubrationibus auctæ et illustratæ," ibid, 1721, he published his final notions on his favourite subject, and continued to maintain the muscular nature and action of the dura mater. Although his opinions have not been received by later anatomists, they were supported with ingenuity, and the investigations, to which the controversy led, contributed to a more accurate knowledge of the parts concerned. Pacchioni died at Rome in 1726. He was a member of the academies of Bologna and Sienna, and of the Society Naturæ Curiosorum. An edition of all his works, with figures, was published at Rome, in 4to., in 1741; in which, among other additions, were the following papers, viz. "Epistola ad Ludovicum Testi de novis circa solidorum et fluidorum Vim in viventibus, ac Duræ Meningis Structuram et Usu Observationibus;" "Vesicantium damna in Multis Morbis;" and "Prolapsi Cordis Historia." Eloy Dict. Hist. Gen. Biog.

PACCHIONI *Glandule*, in *Anatomy*, small white and rounded bodies, connected with the membranes of the brain, and named after an Italian anatomist, who described and delineated them. Bichat calls them *granulationes cerebrales*. See BRAIN, and NERVOUS *System*.

PACCIAUDI, PAOLO MARIA, in *Biography*, an historian and antiquary, was born at Turin in the early part of the eighteenth century. He entered into the order of Theatines, and became librarian to Philip, duke of Parma. He died in 1785. He had passed a studious and retired life, almost entirely occupied in the duties of his station. His principal works are, "De cultu S. Joannis Bapt. Antiquitates Christianæ," 1755; "Monumenta Peloponnesiaca," in two vols. 4to.; "Memorie de Gran Maestri dell ordine Gerofolimitano," three vols. 4to.; and several dissertations on particular objects of antiquity.

PACE,

PACE, or PAICE, RICHARD, a learned priest and considerable statesman, who flourished in the sixteenth century, was probably born at or near the city of Winchester, about the year 1482. He was educated at the expense of Thomas Langton, the bishop of that diocese, who employed him in early life as an amanuensis. His proficiency in learning, and his genius for music, recommended him strongly to his patron, who determined to afford him the best advantages in his power, for the acquirement and cultivation of literature. With this view he sent him to the university of Padua, at that time the most famous seminary of literature in Europe, with a handsome allowance to defray his expenses. Here he was assisted in his studies by Cuthbert Tunstall, afterwards bishop of Durham, and William Latimer. On his return to England he entered himself of Queen's college, Oxford, of which his patron, bishop Langton, who was now dead, had been provost. He was almost immediately taken into the service of Dr. Bainbridge, the new provost, who was soon promoted to the archbishopric of York, and afterwards being made a cardinal, Pace accompanied him to Italy. In this land of assassination Bainbridge was poisoned by a priest, out of revenge for having received a blow from him in the moment of passion. Of the manner of the cardinal's death, of the circumstances attending it, and the measures taken to discover those concerned in it, Pace transmitted an account to king Henry VIII. Upon his return home he was sent for to court, where his talents and accomplishments recommended him so powerfully to the king, that he appointed him secretary of state, and employed him in several important negotiations. His political character did not prevent him from entering into holy orders; and in the year 1514 he was made prebendary of the cathedral of York, and afterwards an archdeacon. In 1515, Henry VIII. being alarmed at the progress which the arms of Francis I., king of France, were making in Italy, sent the archdeacon on an embassy to the court of Vienna, for the purpose of engaging the emperor Maximilian to attempt the expulsion of the French from the duchy of Milan. Having succeeded in his mission, he next went into Switzerland, where he induced some of the cantons to furnish Maximilian with troops. In the year 1519, upon the death of the emperor, when the kings of France and Spain declared themselves candidates for the imperial throne, Henry determined to become their competitor, and sent Pace his ambassador into Germany, to watch over his interests at the diet of the empire. His services on this occasion, though not successful, were rewarded, in the same year, with the deanery of St. Paul's, London, as successor to Dr. Colet, and very soon after he was made dean of Exeter. In 1521 he was presented to a prebendal stall in the church of Sarum, and on the death of pope Leo X., in the same year, cardinal Wolsey sent him with proper instructions to Rome, for the express purpose of endeavouring to obtain for the cardinal the papal chair. The election had, however, taken place before he could arrive at Rome, and Adrian, bishop of Tortosa, had been chosen pope. On the death of Adrian, in 1523, Pace was employed a second time to negotiate on Wolsey's behalf, but with no better success than before. Unable to obtain the grand object of his ambition, the cardinal employed Pace in soliciting from the pope an enlargement of his powers as his holiness's legate, which he obtained. After this he was sent ambassador to Venice, where he acquitted himself with much talent; but notwithstanding the abilities by which he sustained his character as ambassador, Wolsey conceived a prejudice against him, of which he experienced the dire effects. For two years he received no instructions relative to the object of his appointment, nor any remittances for the support of his ex-

pences, notwithstanding the almost incessant applications which he made to England. At the same time intelligence was imparted to him, that the cardinal, who had been his friend, had become inveterately hostile to his interests. This usage had such an effect upon Pace, that he fell sick and lost his intellects. Information of his condition having been brought to the king, he instantly gave directions for his return home, where he was so carefully attended by physicians, at the king's command, that his faculties and health were so far restored, as to be able to direct his attention to literary pursuits. Soon after this, Pace was introduced to the presence of the king, who expressed much satisfaction and pleasure at his recovery, and admitted him to a private audience, in which he took the opportunity of remonstrating against the cardinal's unjust treatment. Wolsey was called upon by the king to vindicate himself against this charge: this he found no difficulty in performing, and in his turn attacked the complainant with such vigour, as to get him sent to the Tower, where he was detained a prisoner for the space of two years, till he was at length discharged by the king's command. The rigour of this treatment was more than Pace could sustain; he was again bereaved of his senses, and never recovered the use of them, except at short intervals, when he was able to read and to enjoy the conversation of his friends. He resigned his church preferments a little before his death, and retiring to Stepney, he died in 1532, before he had completed his fiftieth year. He had passed an active life, and devoted all his leisure from public business to study, the fruit of which he published in several learned works. Of these the first was entitled "De Fructu qui ex Doctrina percipitur Liber:" which was written while Mr. Pace was at Constance, and in the course of which the author took an opportunity of inveighing against drunkenness, a vice very general at that place. The inhabitants considered the attack as levelled against themselves, and an answer was written, apologizing for themselves, and their customs in drinking. Pace's next printed work was "Oratio Pace nuperrime composita et Fœdere percusso inter Henricum Angliæ Regem, et Francorum Regem Christianissimum in Æde Pauli Londini habita." He was author also of "De lapsu Hebraicorum Interpretum;" of "Epistles," and of several other pieces; and of some translations, one of which was a sermon of Fisher, bishop of Rochester, of which he gave a Latin version, which had been preached on the day when the writings of Luther were publicly burnt. Pace was held in high esteem by the learned men of his time. Erasmus denominates him "utriusque literaturæ calientissimus," and addressed to him more letters than to any one of his correspondents. He had an extraordinary facility in learning languages, and not only spoke several modern tongues, but understood the Latin, Greek, Hebrew, Chaldee, and Arabic. Erasmus was attached to him on account of his candour, the mildness of his temper, and his literary acquirements, and could never forgive the persons who had been the cause of his misfortunes.

PACE, *Passus*, *Step*, a measure taken from the space between the two feet of a man in walking.

The *ordinary* pace of a man is two feet and a half; though many reckon it a yard; the *geometrical* or *German* pace, called also the *greater* pace, is five feet.

The ancient Roman and modern Italic mile consists of a thousand paces, *mille passus*. The French league is 3000 paces, and the German 4000.

PACE of the *Horse*, in the *Manege*, a term signifying the particular manner of his going on the road, or when at work. It is also applied to the step or progression of other animals of different kinds. The most common paces, and those which are natural to the horse, are the walk, the trot, and the

the gallop. There is likewise another pace which is acquired by horses, called the amble, but which in some appears to be almost natural to them. In some cases it is not uncommon for horses to mix their different paces, and by this means to go in a sort of shuffle betwixt the walk, trot, amble, and gallop; but horses which make use of this kind of motion are rarely of any great utility or value to their owners.

This bad mode in the progression of the horse may proceed from different circumstances, as habit, a fretful disposition; and perhaps, in some instances, from debility in the back or loins, as well as in the legs or other parts.

Where the horse has a good and proper pace, he moves with steadiness in these several modes of progression without mixing them in any degree whatever.

PACES, in *Surgery*. See *FOOT-DRAWING*.

PACHA. See *BASHAW*.

PACHACAMA, or PACHACAMAC, in *Geography*, a pleasant and fruitful valley in the audience and jurisdiction of Lima, about 12 miles S. from Lima, and celebrated before the conquest of Peru, on account of a famous temple dedicated to the creator of the universe, called by the Incas "Pachacamac."

PACHACAMAC, in *Mythology*, the name which the idolaters of Peru gave to the Sovereign Being whom they worshipped, together with the sun and other imaginary deities. The principal temple of this deity was situated in the valley above-mentioned, and was founded by the Incas of Peru. This idol was held in the greatest veneration: and it is said that their kings and priests entered this temple with their backs towards this altar, and came out again without daring to turn about. Pizarro derived great riches from the temple of Pachacamac, to the amount of 900,000 ducats, although 400 Indians had taken away as much as they could carry, and the Spanish soldiers had pillaged it before he came. The ruins that still remain furnish a very high notion of its magnificence.

PACHAMACLI, in *Geography*, a town of European Turkey, in Romania; 40 miles S. of Filippopoli.

PACHAMAMA, in *Mythology*, the name of a Peruvian goddess.

PACHEA, in *Geography*, a small island in the bay of Panama. This is one of the Pearl or King's islands, low and woody, about 12 leagues from Panama.

PACHECO, JOHN DE, in *Biography*, marquis Villena, the favourite and prime minister of Henry IV., king of Castile. By his insinuating manners and talents he obtained so great an authority, that he disposed, at pleasure, of all places in the kingdom. Lewis XI. of France corrupted him by a pension, and he perfidiously betrayed his master's interests in the peace of 1443, by agreeing to many articles prejudicial to the kingdom of Castile. Henry, having discovered his treachery, reproached him with it, which so provoked Pacheco, that he actually conspired against the power of his sovereign, and proclaimed prince Alphonso king of Castile in 1465. Shortly after this, Alphonso displeased his minister, and fell a victim to his treachery. Pacheco caused the young king to be poisoned, and was reconciled to Henry, who continued him in his authority and favour till his death, in 1473.

PACHECO, FRANCISCO, a painter, who owes his celebrity more to the ingenuity and talents of his scholars Cano and Velasquez, and to his theory and writing, than to his superiority as an artist. He was the pupil of Luis Fernandez, but though partial to the great style, does not appear to have studied it in Italy. With sufficient correctness of outline, judgment in composition, dignity of

characters, propriety of costume, observance of chiaro-scuro, and perspective, Pacheco displeases by want of colour, timidity of execution, and dryness of style. Seville possesses the best of his historic performances; of his numerous portraits, those of his wife and Miguel Cervantes were the most praised. As a man of literature, he possesses considerable erudition; and wit and humour as a writer of epigrams. Fuseli's Pilkington.

PACHELBET. At the latter end of the last century there were several famous organists of this name in Germany: of these, John of Nuremberg, born 1651, is said to have been the first who introduced the overtone style into Germany. He was successively organist of the principal cities of the empire, and greatly improved both vocal and instrumental church music, by his numerous compositions; all which were still held in great esteem, according to Walther, in 1732, when he published his dictionary.

PACHEQUE, in *Geography*, a small island on the S.W. side of the bay of Panama, on the coast of the N. Pacific ocean, and one of the beautiful islands within the semicircular bay from Panama to point Mala. These islands yield wood, water, fruit, fowls, hogs, &c., and afford excellent harbour for shipping.

PACHERRY, a town of Meckley; 90 miles S.S.E. of Munnypour.

PACHETE, a circle of Bengal, bounded on the N. by Currackdeagh, on the E. by Burwan and Bissanpour, on the S. by Midnapour, and on the W. by Sillee, Tamar, and Rangur; about 70 miles long and from 12 to 40 broad. The capital is Rogonatpour. It derives its name from a fort, six miles N.E. from the capital.

PACHI, or PACH-HOUTOC, a town of Thibet; 70 miles S.E. of Hami.

PACHICA, a town of Peru, in the government of Buenos Ayres, seated on this coast, S. lat. 22°.

PACHIRA, in *Botany*, Aublet's name for the Cayenne tree which the French call *Cacao sauvage*, or Wild Chocolate. Nothing is to be discovered of its etymology or meaning. See *CAROLINEA*, which is indubitably the same plant.

PACHIRA, in *Geography*, a town of Peru, in the diocese of Truxillo; six miles N. of Payta.

PACHITEA, a river of South America, which joins the Maranon at 8° 26', and is esteemed the most beautiful of all its tributary streams. It rises in 10° 46', first running E., then N., and in the early part of its progress it is called the Pozuzu, especially at its confluence with the Mayro, where it forms a noted haven, from which there is an open navigation to the Maranon.

PACHODECARHOMBIS, in *Natural History*, the name of a genus of fossils, of the class of the selenitæ.

The word is derived from the Greek *παχυς*, thick, *δίζα*, ten, and *ρῶμβος*, a rhombus, and expresses a thick rhomboidal body, composed of ten planes.

The characters of this genus are, that the selenite of it consists of ten planes; but as the top and bottom in the leptodecarbombes, or most common kind of the selenitæ, are broader and larger planes than any of the rest, the great thickness of this genus, on the contrary, makes its four longer planes in all the bodies of it, meeting in an obtuse angle from its sides, its largest planes. Of this genus there are four species.

PACHOMIUS, in *Biography*, a saint in the calendars of the Greek and Latin churches, who flourished in the fourth century, was a native of Thebais or Upper Egypt, and born of Gentile parents, who brought him up in their religion. When he was twenty years of age, he was forced to bear arms in the war of Constantine against Maxentius, by which

which means he had the first opportunity of meeting with any Christians who shewed him hospitality and kindness, and to whose faith he avowed himself a convert, as soon as he was relieved from military service. He immediately began to practise all the austerities of that superstition of which St. Anthony had lately proved himself the parent. He now formed the design of establishing a community of persons subject to the same rules of an ascetic life, and fixed his abode at Tabenna in Upper Egypt, on the banks of the Nile, where he built a monastery, and established rules of discipline, which it was reported had been dictated to him by an angel. In a short time the fame of his sanctity drew to him such numbers of disciples, that his house overflowed, and he was obliged to erect new ones, from time to time, till the Upper Thebais was almost filled with monasteries of his order. He died in the year 350, or, according to others, in 360. In his life, written by an ancient Greek author, and translated into Latin by Dennis le Petit, many miracles are ascribed to him; and in Benedict of Aniana's "Codex Regularum," there are preserved eleven of his "Letters," written with great simplicity, and addressed to the superiors of the monasteries founded by him. In the life already referred to, are preserved the rules of discipline, pretended to have been divinely communicated to him, and in the fourth volume of the "Bibl. Patr." a larger collection of rules, concerning the diet, the habits, the employments, and the discipline of monks, which is said to have been translated from Pachomius' original in the Egyptian language into the Greek, and from Greek, into Latin by St. Jerome. Moreri.

PACHORE, in *Geography*, a town of Hindoostan, in the circar of Gohud; 10 miles N.N.E. of Ahar.

PACHUCO, a town of Mexico, famous for the silver mines in its vicinity. It is said, that of these there are not less than 1000. One of them, called Trinity, is supposed to be as rich as any in Mexico; 45 miles N.N.E. of Mexico. N. lat. 20° 45'. W. long. 100° 42'.

PACHUNTICA, formed from *παχυνη*, *I incrassate*, a term used by some medical writers to express incrassating medicines.

PACHYMER, or PACHYMERUS, GEORGE, in *Biography*, a Greek historian, was born at Nicæa, of a Constantinopolitan family, in the middle of the 13th century. He entered into the church, and was likewise employed in offices of importance in the state under Michael Paleologus and Andronicus. At the age of nineteen he accompanied the former, when he took possession of Constantinople in 1261. He died in the year 1310. He was author of a valuable portion of the history of the East, which is inserted in the collection of the Byzantine historians, and was published at Rome in 1669. It consisted of thirteen books, and contained an account of the reign of Michael, and that of Andronicus, down to his twenty-third year. The style is said to be harsh and obscure, yet it is not wholly deficient in eloquence, and the author displays a more free and enlightened spirit than most of his countrymen. This history was translated into French by the president Cousin. To Pachymer is attributed a paraphrase on the epistles of Dionysius the Areopagite, and a treatise on the procession of the Holy Ghost; a compendium of the Aristotelian philosophy was published from his MS. at Oxford in 1666. Moreri.

PACHYSANDRA, in *Botany*, a genus of Michaux, was thus named from *παχυς*, *thick or clumsy*, and *ανδρς*, *a man*, in allusion to the thickness of the stems. Michaux *Boreali-Amer.* v. 2. 177. Willd. *Sp. Pl.* v. 4. 339.—Clafs and order, *Monoclea Tetrandria*. Nat. Ord. *Tricocca*, Linn. *Euphorbia*, Juss.

Gen. Ch. Male, *Cal.* Perianth of three oval, concave, upright leaves, one of them external, and rather the smallest. *Cor.* Petals two, oval, concave, rather larger than the calyx. *Stam.* Filaments four, erect, thrice as long as the petals, very thick, compressed, and somewhat club-shaped; anthers incumbent, oblong, of two cells, finally curved.

Female, *Cal.* Perianth of three close-pressed, oblong, acute leaves, one of them external. *Cor.* Petals four, oval, smaller than in the male, closely pressed to the germen. *Pist.* Germen superior, rather globose, with three furrows; styles three, recurved, with a longitudinal furrow above; stigmas linear, flattish. *Peric.* Capsule nearly globular, three-lobed, crowned with three spreading horns from the permanent styles, of three cells. *Seeds* two in each cell, oblong, smooth, pendulous from the summit of the cell.

Ess. Ch. Male, Calyx of three leaves. Petals two. Stamens thrice as long as the petals.

Female, Calyx of three leaves. Petals four. Styles three. Capsule with three horns, and three cells. Seeds two in each cell.

1. *P. procumbens*. Michaux v. 2. 178. t. 45.—Gathered by Michaux on the western side of the Alleghany mountains in North America. The root is fibrous and perennial. *Stem* herbaceous, procumbent in the lower part, then ascending, round, smooth, leafy above, about a span high, scarcely branched. *Leaves* alternate, stalked, ovate, about two inches long, smooth, veiny, and ribbed; entire at the base, bluntly and broadly toothed in the upper part. *Spike* simple, solitary? from the base of the stem, erect, rather lax, two inches long, composed of about two female flowers, and four times as many male ones above them. *Corolla* finely fringed. *Capsule* somewhat downy.—Michaux remarks, that the character of this genus is almost the same as that of *Buxus*, but the habit totally different. We have presumed to alter his description a little with the *Buxus* before us, in order to compare and contrast them, as well as we could without examining his plant.

PACIAN, in *Biography*, a saint in the Roman calendar, and bishop of Barcelona in the fourth century, was descended from a noble Spanish family, and flourished towards the close of the fourth century. He had been a married man previously to his entering the religious community of which he was a member. He died at an advanced age, leaving behind him a son, named Flavius Dexter, who was the person to whom Jerome inscribed his catalogue, and at whose request it was drawn up. Pacian wrote many books, among which, one was entitled "Cervus," or *The Stag*, a satirical piece, written against the Pagans, and abounding, it is said, in wit and eloquence; but no part of it has reached modern times. There are still extant, attributed to Pacian, "Three Letters to Sempronian, a Novatian," which are probably the treatises mentioned by Jerome; also "An Exhortation to Repentance," and "A Discourse concerning Baptism," addressed to the Catechumens. They were edited by John de Tilly, at Paris, in 1538; by Paul Manutius, at Rome, in 1564, and they are inserted in the fourth volume of the *Bibl. Patrum*. A more correct edition of the whole, excepting the "Discourse on Baptism," collated with a MS. of the year 800, was afterwards given by cardinal d'Aguirre, in the second volume of the Spanish Councils, illustrated with numerous learned notes. The writings of Pacian are panegyricized by Dupin: "His exhortations," says the ecclesiastical historian, "are lively and persuasive; his thoughts well weighed; his proofs solid; his manner of writing pleasant; his style elegant, and the periods short. In a word, these little tracts may pass for master-pieces in their kind, and the two exhortations, or discourses, may be looked upon

upon as perfect models of popular preaching." Dupin. Lardner, vol. iv. 8vo. edit. 1788.

PACIFIC, peaceful, or free from troubles, tumults, &c.

PACIFIC *Age* is a denomination given to that period in which our Saviour was born, on account of the general peace which then prevailed through the Roman empire.

PACIFIC *Letters, Literæ Pacificæ*, in the *Ancient Church*, was a denomination given to all sorts of letters testimonial, given by the bishop or chorepiscopus to their priests, when they had occasion to travel abroad; certifying that the bearer was a Catholic, and in communion with the church.

The life of pope Sixtus I. taken from the pontifical of pope Damasus, mentions that pope as the first who introduced those letters called *Formatæ, Canonice, Commendatitæ, Communicatorie, Ecclesiasticæ, & Pacificæ*.

PACIFIC *Ocean, or South Sea*, in *Geography*, that vast ocean which separates Asia from America: it is called *Pacific*, from the moderate weather which the first mariners, who sailed in it, met with, between the tropics; and it was called the *South Sea* because the Spaniards crossed the Isthmus of Darien from north to south. It is properly the western ocean, with regard to America.

Geographers call the South sea, *Mare Pacificum*, the *Pacific Ocean*, as being less infested with storms than the Atlantic. Mr. Frezier affirms, it does not deserve that appellation; and that he has seen as violent tempests therein as in any other sea: but Magellan happening to have a very favourable wind, and not meeting with any thing to ruffle him, when he first traversed this vast ocean, in 1520, gave it the name which it has retained ever since. Maty, however, adds, that the wind is so regular there, that the vessels would frequently go from Acapulco to the Philippine islands, without shifting a sail.

This ocean fills the grandest concavity of the globe, occupying nearly half of its surface from the eastern shores of New Holland to the western coast of America; and it is diversified with several groups of islands, which seem, as it were, the summits of vast mountains emerging from the waves. Separately considered, this immense concavity receives but few rivers; the chief being the Amur from Tartary, and the Hoan-ho and Kian-ku from China, while the principal American rivers run towards the east. This ocean, considered as the boundary of the Russian empire, washes the shores of the government of Irkutsk, from Tschukotskoy Nofs, or Cook's Straits, to the frontiers of China; or, in other words, from the mouth of the river Aimakan, that is, from 65° to 45° N. lat. It is divided into two great parts. That lying eastwards from Kamtschatka, between Siberia and America, is eminently styled the Eastern, or the Pacific ocean; that on the W. side from Kamtschatka, between Siberia, the Chinese Mongoley, and the Kurilly islands, is called the sea of Okhotsk. From the different places it touches, it assumes different names: *e. g.* from the place where the river Anadyr falls into it, it is called the sea of Anadyr; about Kamtschatka, the sea of Kamtschatka; and the bay between the districts of Okhotsk and Kamtschatka, is called the sea of Okhotsk, the upper part of which is termed Penjinskoye mare, that is, the Penjinskian sea, as it approaches the mouth of the river Penjina.

PACIFICATION, the act of restoring or re-establishing the public peace and tranquility.

The word is applied to many ordinances of the kings of France, designed to pacify the troubles that occurred in the kingdom, with regard to religion, during the 16th century, and particularly appropriated to the periods put to the religious broils raised in France in the year 1598, by the

edict of Nantz; and the civil commotions, between the English and Scots, ending in 1638.

PACIFICATOR is commonly understood in the same sense with mediator; *viz.* one who endeavours to reconcile princes or powers at variance.

Wicquefort makes a difference between mediator and pacificator. The peace being concluded between France and England in 1621, the instruments on each side were put in the hands of certain ambassadors, who had been employed as pacificators, not as mediators, to be kept till such time as the ratification had been exchanged. So the archbishop of Pisa, the duke of Tuscany's ambassador at Madrid, was never esteemed a mediator, though the French ambassadors allowed him to be present at the conferences held with the commissioners of Spain, to act as a pacificator of the differences between them. The grand duke had not offered his mediation, nor would France have accepted it. Wicquefort, part ii. sect. 11.

PACIFICATORS, in *Church History*, a name given to those who, in the sixth century, followed the Henoticon of Zeno.

PACIFICUS, in *Mythology*, an epithet of Jupiter, synonymous with Salamines among the Syrians, derived from the Hebrew "Salman," which generally signifies *pacatus fuit*.

PACIFICUS MAXIMUS, in *Biography*, a Latin poet, was born at Ascoli, of a noble family, in 1409: the time of his death is not known, but his poems were printed at Florence in 1489, under the title of "Heccateligiam sive Elegiæ:" this edition is now very scarce. That of Parma, with his other works, in 1691, is purged of many licentious passages that occur in the former. He mentions the venereal disease in his poems before the discovery of the new world by Columbus.

PACINISCO, in *Geography*, a town of Naples, in Lavora; 11 miles E.S.E. of Sofa.

PACIO, GIULIO, in *Biography*, a distinguished jurist and philosopher, was born at Vicenza in the year 1550. From an early age he was distinguished for his proficiency in letters, and being destined for the study of the law, he was sent to Padua, where he studied under the ablest masters that could be obtained. On his return to Vicenza, his propensity to enquiry led him to peruse the writings of the Reformers, for which he was accused to the bishop, who gave orders for his apprehension. He accordingly took refuge at Geneva, where, being destitute of other means of support, he opened a school for children. In 1578 he was chosen professor of jurisprudence in that city. He married a lady of Lucca, who was also a refugee, by whom he had ten children. In 1585 he was invited to a professorship at Heidelberg, and on his acceptance of that office he delivered an oration, "De juris civilis difficultate ac docendi Methodo," which he afterwards printed, signing himself Beriga, from a country-house belonging to his family. He remained at Heidelberg till 1595, when he quitted it for Sedan, where the duke of Bouillon had established a new academy. In this he held the logical chair till the war broke out, which obliged him to return to Geneva. Soon after he was elected principal of the college of Nismes, thence he removed to the professorship of civil law at Montpelier, where he had as a domestic pupil the celebrated Peirefc. It was the great object of the pupil to bring back his master to the Catholic faith; and for this purpose he wished to fix him, with a large stipend, at the university of Aix. But Pacio's wife, more zealous than himself for the new principles, could not be brought to reside in a Catholic city. At length, however, he refused a flattering invitation from the university of Leyden, because he had again become a Catholic. In 1616 he removed to Valence

in Dauphiné, where he occupied the chair of the celebrated Cujas, with a very high salary. About the year 1619, he published a work concerning the dominion of the Adriatic sea, on account of which he was honoured by the republic of Venice with the order of St. Mark; it also procured him a pressing invitation to a professorship at Padua, which he accepted for a very short time; after this, in 1621, he returned to Valence, where he continued his professional labours till his death, in 1635. The works of this writer are numerous, and chiefly on legal or philosophical topics, in both of which sciences he was profoundly versed. He published new and accurate versions of several of Aristotle's works, which have ranked as models of translations. The great honours and emoluments which he received, and the contests which subsisted among the most famous universities to obtain possession of him, sufficiently prove that he was one of the most considerable scholars of that period. The titles of his most important works are, "De Contractibus;" "Synopsis Juris;" "De Jure Maris Adriatici;" "Corpus Juris Civilis." He wrote a treatise on arithmetic at the age of thirteen.

PACK, in *Commerce*, denotes a quantity of goods, made up in loads, or bales, for carriage. A pack of wool is a horse's load, containing seventeen stone and two pounds, or 240 pounds weight. See *Wool*.

PACKAGE, a duty set and rated in a table taken of goods and merchandises; and all goods not specified in the table are to pay for package duties, after the rate of one penny in the pound, according as they are valued in the book of rates.

PACKERS are really, what their title expresses, packers as well as pressers of all sorts of bale goods (intended for exportation), for the great trading companies and merchants, for which they are answerable, if they should happen to receive any damage through bad package; besides this, several of them are considerable dealers.

PACKERSFIELD, in *Geography*, a township of New Hampshire, Cheshire county, E. of Keene, on the head branches of Ashuelot river, containing 977 inhabitants; 86 miles W. of Portsmouth.

PACKET, or PACKET-BOAT, a vessel appointed by government to carry the mails of letters, packets, and expresses, from one kingdom to another, by sea, in the most expeditious manner. Thus, the packet-boats under the direction of the post-master-general of Great Britain carry the mails from Dover to Calais, in time of peace; from Falmouth to Lisbon, Gibraltar, Malta, the West Indies, and America; from Harwich to Helvoetsluys, or Gottenburgh and Heligoland; from Weymouth to Guernsey and Jersey; from Parkgate and Holyhead to Dublin; and from Milford to Waterford. See *Post*.

PACK-HORSE, in *Agriculture*, such a horse as is employed in carrying heavy loads on the back in the manner of a pack.

For this use, horses should be close, well made, and strong.

PACKMOTE BAY, in *Geography*, a bay on the east coast of the island of Martinico.

PACO CAATINGA, in *Botany*, a coniferous species of Brazilian canna. Margr.

There is a second species of this plant, which is distinguished by the sweetness of its leaves underneath, and by its red flowers; and a third species, known by its ceruleous tetrapetalous flowers. Ray.

PACO *Seroca*, Marg. *piso*, a species of Brazilian canna, which bears its fruit in clusters at the bottom of the stalk. The fresh leaves, as well as the stalk and fruit, before it is ripe, being rubbed, give a smell like ginger, which is

VOL. XXVI.

very grateful, and therefore serves instead of spices. They are also used in hot-baths. Ray.

PACOLET, in *Geography*, a small river of America, in South Carolina, which unites with Broad river, 30 miles above Tyger river, and 24 S. of North Carolina line. On this river are the famous Pacolet springs; 17 miles above its confluence with Broad river.

PACORUS, in *Biography*, son of Orodes, king of Parthia, signalized himself by the defeat of Crassus, whose army he nearly cut to pieces, in the year 53 B. C., and whom he made prisoner. He took Syria from the Romans, supported the republican party of Pompey, and that of the murderers of Julius. After ravaging Syria and Judea, Ventidius defeated him, and Pacorus was slain in battle in the year 39 B. C.

PACOS, in *Zoology*. See *CAMELUS Paco*.

PACOURIA, in *Botany*, a genus in Aublet, t. 105, who names it thus from the Caribbean appellation *Pacouri-rana*, Jussieu retains it, Gen: 148, expressing a doubt of its being distinct from *Ambelania* of the same author, t. 104. Both are united by Schreber and Willdenow, under the name of *WILLUGHBEIA*; see that article.

PACOURII, De Laet. a vast tree growing in the island of Maragnan, belonging to Brazil; it bears leaves like those of the apple-tree, a white flower, and a fruit of the bigness of two filts. The rind or peel of this fruit, which is about an inch thick, being boiled or preserved in sugar, is reckoned a delicacy. Ray.

PACOURINA, one of Aublet's unexplained names. See *HAYNEA*.

PACQUING, in *Ornithology*, a name given by the people of the Philippine islands, to a small bird of the sparrow kind, but very beautifully variegated. It feeds on the seeds of grass.

PACK-RAG DAY, in *Rural Economy*, a provincial term, signifying the day after Martinmas-day, the time of changing farm-servants.

PACK-SADDLE, a saddle adapted to the carriage of heavy packs or burdens.

PACK-WAY, in *Rural Economy*, a provincial word, signifying a bridle-road, or horse-path.

PACT, PACTUM, or *Pactio*, in *Law*, a covenant or convention between two or more parties.

Ulpian derives the word from the Latin verb *pacisci*, to bargain, agree, contract: others, with more probability, from *paco*, I appease, or *pacify*: or from *pango*, I fix, establish.

The civil lawyers, after Ulpian, define the word pact, the consent of two or more parties to the same thing. "Duo-rum aut plurium in idem consensus," lib. iii. sect. 2. ff. de *pactis*.

There are two species of conventions, viz. the *pact*, and *contract*. A pact against good manners, against public or natural equity, is null. It is a maxim in law, *Ex nudo pacto non oritur lex*.

PACTA CONVENTA, in Poland, are the articles agreed on between the king and the republic, and which they mutually oblige each other to observe.

These stipulations were introduced after the demise of Sigismund Augustus, in 1572, when all title to the crown, from hereditary right, was formally abrogated, and absolute freedom of election established. At this era a charter of immunities was drawn up at a general diet, to be ratified by the new sovereign before his election. The groundwork of this charter, termed in the Polish law "pacta conventa," was the whole body of privileges obtained from Louis and his successors, with these additions: 1. The king to be elective, and his successor never to be appointed during his life:

2. The diets to be assembled every two years: 3. Every noble or gentleman in the whole realm to have a vote in the diet of election: 4. Should the king infringe the laws and privileges of the nation, his subjects were absolved from their oaths of allegiance. From this period, the "pacta conventa," occasionally enlarged, have been confirmed by every sovereign at his coronation.

PACTOLUS, in *Ancient Geography*, a river of Asia, which had its rise on mount Emolus, in Lydia, watered the plain adjoining to Sardis, traversed that town, and ran into the Hermus, which discharged itself into the gulf of Smyrna. This river is said to have contained a quantity of gold. As to the fable related concerning it, we refer to MIDAS. The kings of Persia obtained possession of the Pactolus and its treasures, by Cyrus's conquest of Lydia. Xerxes I. drew gold from the Pactolus, and this valuable metal was furnished by it in the time of Herodotus: but it afterwards failed long before the time of Strabo. The gold of the Pactolus was derived from the mines of mount Emolus; and when these were exhausted, the supply of the river was discontinued. This river was, according to Varro and Chrysostron, the chief source of the wealth of Cræsus.

PACUVIUS, MARCUS, in *Biography*, a Latin tragic poet, was a native of Brundisium, and is said to have been the sister's son of Ennius. He flourished about the year 154 B.C., and is renowned as the friend and guest of C. Lælius. In the rude state of the Roman theatre, he obtained a high reputation; and his tragedy of Orestes is mentioned by Cicero in his "De Amicitia," as having been heard with thunders of applause. He was the author of some satires, and had a talent for painting. In advanced life he retired from Rome to Tarentum, where he died, having nearly reached his ninetieth year. The fragments of his work, which still remain, have been published in the "Corpus Poetarum Latinorum" of Mattaire. Moreri.

PACY, in *Geography*, a town of France, in the department of the Eure, and chief place of a canton, in the district of Evreux, seated on the Eure, and formerly surrounded with walls; 11 miles E. of Evreux. The place contains 1750, and the canton 9930 inhabitants, on a territory of 165 kilometres, in 32 communes.

PACZANOW, a town of Poland, in the palatinate of Sandomirz; 28 miles E.S.E. of Sandomirz.

PAD, in *Rural Economy*, a term applied to a sort of stuffed cushion, a foot-path, and also to an easy paced horse.

PAD-Saddle. See **SADDLE**.

PADA, in *Geography*, a town of Hindoostan, in the circuit of Gangpour; 30 miles E. of Gangpour. N. lat. 21° 58'. E. long. 84° 39'.

PADANG, a sea-port town on the W. coast of the island of Sumatra. This was the principal settlement of the Dutch, who established themselves here because it was in the vicinity of Menayeabow, the richest seat of gold; and it was under the government of a director and council. The fort is situated within 40 yards of the north bank of the river, and is of a square form, having four bastions of stone, and walls about nine feet high. On the south side of the river are high mountains, which extend to the sea-coast. The water is very good; and both cattle and fruit are plentiful and cheap. Padang, before its capture by the English, in 1781, used to draw to itself about a third part of the whole quantity of gold procured at the several ports on the W. coast of Sumatra, which has been estimated at about 10000 ounces annually. In this place there has been a considerable manufacture of filagree. (See **FILIGRANE**.) S. lat. 0° 40'. E. long. 99° 48'.

PADANG, a small island in the East Indian sea, near the W. coast of Borneo. S. lat. 0° 33'. E. long. 109° 21'.

PADANG-Goochie, a river of Sumatra, which divides the Lampon country, or a portion of the southern extreme of the island, from Passumah, near the sea-coast.

PADASJOKI, a town of Sweden, in Tavastland; 36 miles N.E. of Tavasthus.

PADATO, a town of Mexico, in the province of Culiacan; 40 miles N.W. of Culiacan.

PADBERG, a town with a citadel, in the kingdom of Westphalia; 5 miles E. of Brilon.

PADDA, or **RICE-BIRD**, in *Ornithology*. See **LOXIA Oryzivora**.

PADDA. See **RICE**.

PADDINGTON, in *Geography*, a parish and village in the hundred of Ossulston, and county of Middlesex, England, is situated at the north-western extremity of London. The parish, which extends about two miles in length, is bounded by Kenfington, St. Margaret's, Westminster, and St. George's, Hanover-square, on the south; by Wilfson on the north; by Mary-le-Bone on the east; and by Kenfington, and a detached part of Chelsea, on the west. According to a survey, its area comprises 1197 acres, 3 roods, and 30 perches, of which about one hundred acres are laid out as garden-ground, and the remainder is occupied by houses, and appropriated to pasturage.

The village of Paddington stands about a mile to the north of Tyburn turnpike. Like most of the other villages connected with the metropolis, it has increased greatly in extent of late years, and, since the opening of the canal in 1801, has become a place of considerable commercial importance. This canal, which derives its name from the parish, branches off from the Grand Junction canal near Norwood, and passing through the parishes of Ealing, Northall, Greenford, Perivale, Harrow, Acton, Fulham, Twyford, and Wilfson, as well as the detached parts of Chelsea and Kenfington, terminates at this village in a large basin, on the sides of which are convenient wharfs and warehouses, belonging to the Paddington canal company. The advantages of this cut must be obvious to every one at all acquainted with the inland navigation of this country. By entering the Grand Junction canal, it affords to Paddington, directly or indirectly, a navigable communication with almost every trading or manufacturing town in the kingdom. The New, or Regent's canal, which is to connect the Paddington canal with the river Lea, and consequently with the Thames below London, is now in rapid progress of execution; and this may likewise be regarded as a measure which promises much commercial benefit, not only to the capital but to the country at large.

Paddington manor in ancient times constituted part of the possessions of Westminster Abbey; at the dissolution it was annexed to the bishopric of Westminster; and when that see was abolished, soon after its establishment, Edward VI. transferred it to Ridley, bishop of London, and his successors, along with the advowson of the church, which is supposed to have first become parochial about the same time. The church, since that period, has been twice erected; first by sir Joseph Sheldon, lessee of the manor, little more than a century ago, and again in 1791, by the parish, under the authority of an act of parliament. It is a square building, with a projecting wing on each side, and a portico of the Doric order, fronting the south. Several persons of note lie buried, both in the church and in the surrounding cemetery, among whom are John-Henry, marquis of Lansdown, Dr. Geddes, and the celebrated statuary Banks. In Lyfson-Green is a small chapel of ease, called the "Bentinck-chapel;"

chapel;" and close to the Mary-le-Bone turnpike is another place of worship, erected within the last few months, and denominated the "Paddington chapel."

In this parish are the hamlets of Baywater, and Tyburn. Contiguous to the former are large public tea-gardens, formerly appropriated as physic-gardens by the late sir John Hill. Here is also the Queen's Lying-in hospital, originally instituted in 1752, in St. George's Row, near Tyburn turnpike, but removed hither in 1791. It is an excellent establishment, and is much indebted for its present prosperity to the active exertions of their royal highnesses the dukes of Suffex and Cambridge. Tyburn is noted for having been the place of execution for the malefactors of London and Middlesex, till the year 1783. Here were likewise nine of the city conduits, and a banquetting-house, belonging to the lord mayor, which was demolished in 1737. None of the conduits now remain, but there is a large reservoir newly constructed, at a short distance to the westward of the canal basin, whence a considerable division of the west end of the town is supplied with water.

Paddington parish, according to the late parliamentary returns of 1811, contains 935 houses, and a population of 4609 persons. A charity-school, established here in 1802, for thirty boys and the same number of girls, is supported by voluntary contributions; and there are several alms-houses for the accommodation of the poor, the gifts of various benefactors. Lysons's *Enviours of London*, &c. vol. iii. edit. 1795. Supplement by the same author, 4to. 1811.

PADDLE, a term used for a small sluice; such are those that fill and empty the locks of a canal. See **LOCK**.

PADDLE-hole is the crooked arch *ee* (*Plate V. Canals*, fig. 36.) which gives a passage for the water from the upper pound to fill the lock.

PADDLE-Weirs. See **LOCK-Weirs**.

PADDLE, a sort of oar used by the natives of Africa, America, and some of the islands in the South Sea. They are made of light wood of various shapes, but mostly shorter and broader in the blade than our oars, and instead of rowing with them horizontally like an oar, they manage them very dextrously, in a perpendicular manner, either for rowing or steering.

PADDLE, in *Glass-making*, a name of an instrument with which the workman stirs about the sand and ashes in the calcar.

PADDLE-Staff, in *Agriculture*, an implement used by ploughmen to free the share from stubble, earth, clay, &c. which impede its action.

PADDOCK, or **PADDOCK Course**, a piece of ground, generally taken out of a park, ordinarily a mile long, and a quarter of a mile broad, encompassed with pales or a wall, for the exhibiting of races with greyhounds, for wagers, plates, or the like.

At one end of the paddock was a little house, where the dogs were to be entered; and whence they were slipped; near which were pens to enclose two or three deer for the sport.

The deer, when turned loose, ran all along by the pale; and the spectators were placed on the other side.

Along the course were several posts; *viz.* the law-post, 160 yards from the dog-house and pens; the quarter of a mile post; half-mile post; and pinching post; beside the ditch, a place made to receive the deer, and preserve them from farther pursuit. Near the ditch were placed judges, or triers. For further particulars, see the article **COURSING**.

PADDOCK, in *Agriculture*, a small field or inclosure. It also signifies a large toad.

PADENS, in *Commerce*, a sort of bitter almonds from Per-

sia, which are used at Surat for money, about 60 of which pass for one pice.

PADEPATNAM, in *Geography*, a town of Hindoostan, in the Carnatic; 35 miles S.S.E. of Tanjore.

PADER, a river of Westphalia, which rises near Paderborn, and about three miles from the town is joined by two other streams, and forms the Lippe.

PADERBORN, a city of Westphalia, and capital of a bishopric of the same name. The bishopric or principality is bounded on the N. by the county of Lippe, on the E. by Hesse and Calenberg, on the S. by the duchy of Westphalia and the principality of Waldeck; and on the W. by the counties of Reitberg and Lippe, in the duchy of Westphalia; its greatest length being about 44 miles, and its greatest breadth 36. The greatest part of it is fertile, and produces a good breed of cattle; but some part of it is an extensive heath. It has some good iron-mines, salt and medicinal springs, and several rivers that abound in fish: the principal of which are the Weser, Dimel, Nette, Lippe, Alm, and Pader. In 1802 this bishopric was given to the king of Prussia, and by the peace of Tilsit, it became a province of the new kingdom of Westphalia.

The city was chosen by Charlemagne as a place of abode, when he wished to put an end to the Saxon war of 30 years' duration; accordingly he fixed his camp here, and erected it into a bishopric, which was confirmed by pope Leo. Hence the town became considerable, and several diets were assembled here. It enjoyed imperial privileges, carried on a great trade, and was reckoned one of the Hanse-towns. At present it has much declined, and its trade is become insignificant. Besides the cathedral, it has a collegiate and two parish churches; 42 miles S. of Minden. N. lat. 51° 40'. E. long. 8° 54'.

PADERNA, a town of Portugal, in the province of Algarve; 9 miles N. of Silvas.

PADEW, a town of Poland, in the palatinate of Sandomirz; 32 miles W. of Sandomirz.

PADILLA, **DON JUAN DE**, in *Biography*, the leader of a popular insurrection in Castile against the ministers of Charles V., was the eldest son of the commendator of Castile. When the cortes, or parliament of Spain, assembled in Galicia, and had voted the emperor a free gift, without obtaining the redress of grievances under which the nation laboured, the citizens took up arms, gained possession of the castle, established a popular form of government, and chose Padilla as their leader. He was well qualified for the duties imposed upon him, and his zeal was animated by that of his wife, Maria de Pacheco, a lady of noble birth, great abilities, and unbounded ambition. The regent, cardinal Adrian, having sent a body of troops under Ronquillo for the reduction of the revolted citizens, Padilla came to their assistance with a considerable reinforcement, and gave Ronquillo a defeat. He then, in concurrence with the other leaders, appointed a general convention of the malcontents, to be held at Avilla. In this assembly, deputies appeared from almost all the cities entitled to representation in the cortes, and formed a solemn league of mutual defence, under the title of the junta. They placed the dowager queen Joanna, who was almost in a state of mental debility, at the head of the government, renounced the authority of the regent, and carried on all their operations in her name. Padilla next proceeded to Valladolid, where he reduced Adrian to the condition of a private person, and seized upon the archives and seals of the kingdom. The junta then drew up a remonstrance, containing a statement of grievances, with demands for redress, which struck no less at the privileges of the nobility than at the prerogatives of the crown; and thereby

thereby produced an union of the nobles with the royalists. The junta, at first, jealous of the popularity of Padilla, substituted at the head of a large army Don Pedro de Giron, a nobleman high in rank, but wholly unequal to the trust committed to him. Through his unskilfulness the person of the queen was recovered by the royalists, together with the seals and public archives, and several of the members of the junta were made prisoners. Padilla was now raised to the chief command, and to procure the necessary supplies of money, Donna Maria went with her train to the cathedral of Toledo, in which was contained a vast treasure of ecclesiastical wealth. She entered it in solemn procession, with all the marks of the deepest sorrow and contrition, and her train, after much ceremony, proceeded to the pillage which afforded a rich booty. Padilla was for a time successful in various small encounters, but at length the royal army advanced upon them, in April 1521, and put them to flight almost without resistance. Padilla attempted, but in vain, to rally them, and resolved not to survive the ruin of his party. He rushed among the thickest of the foe, was wounded and made prisoner, together with his principal officers. On the next day, without the form of trial, he was led to execution. He viewed the instruments of death without terror or dismay, and having written two manly and eloquent letters to his wife, and to the city of Toledo, he quietly submitted to his fate. When the sentence was read proclaiming them as traitors, one of his fellow sufferers betrayed emotions of indignation, but Padilla restrained him, observing, "that yesterday was the time to have acted with the spirit of gentlemen; to day that of dying with the meekness of Christians." After his death, his widow Donna Maria supported the sinking cause, and to revenge his fate, she raised fresh forces, and used every art to animate the citizens of Toledo to a vigorous resistance. She marched through the streets with her son, in deep mourning, seated on a mule, before whom a standard was borne representing his father's execution. At length, however, the city was invested by the victors, and though she defended the citadel, to which in an early period of the siege she retired, with great resolution for four months, she was at last under the necessity of escaping in disguise, and fled to her relations in Portugal, where she ended her days. Robertson's Hist. of Charles V.

PADILLA, LORENZO DE, one of the historiographers of Charles V., is celebrated on account of his great eminence as a Spanish antiquarian. He took great pains in preserving Roman inscriptions, and ascertaining the classical geography of Spain. Among other works, he left a general history of Spain, in four parts, a few sheets of which have been preserved, a proof that it had been committed to the press, though the impression was probably never completed. The manuscript is still in the Dominican library of St. Paul's at Cordova. Padilla was one of the earliest genealogical writers among the Spaniards. Gen. Biog.

PADLEE, in *Geography*, a town of Hindoostan, in Guzerat; 10 miles S. of Durrampour.

PADMA, or **PEDMA**, in *Mythology*, is an attribute of the Hindoo deity of Vishnu, and in pictures and statues is generally seen in one of his four hands, in the form of a lotos or lotus, for which lovely aquatic padma, or pedma, is a Sanscrit name. (See **LOTOS**.) As there noticed, Pedma is a name of Lakshmi, consort of Vishnu, as is also Pedmala, and Pedmalaya. Pedma-devi, meaning goddess of the lotos, or perhaps queen of beauty, is a name likewise given to Lakshmi, and sometimes to Parvati, the consort of Siva. Pedma-nabha, and Pedmaksha, denoting lord or possessor of the Pedma, or of Lakshmi, are other names of Vishnu. Kamala is another Sanscrit word for the lotos,

and for the goddesses named after it, similar to Pedma. (See **KAMALA** and **LAKSHMI**.) One of the eighteen sacred mythological poems is named Padma Purana. See **PURANA**.

PADOBE' of *Senegal*, in *Ornithology*. See **TURDUS Erythropterus**.

PADOGI, a species of punishment used in Russia. In this punishment the body of the criminal is stripped to the waist, and then laid upon the ground; one slave holds the head between his knees, and another the lower part of the body; then rods are applied to the back, till some person gives notice to desist, by crying out enough.—This punishment is considered in Russia merely as a correction of the police, exercised on the soldier by military discipline, by the nobility on their servants, and by persons in authority over all such as are under their command.

Ever since the accession of Elizabeth to the throne of Russia, the punishments were reduced to two kinds, *viz.* the padogi and knout.

PADOLA, in *Geography*, a town of Italy, in the Cadore; 12 miles N.N.E. of Cadore.

PADONGMEW, a town of the Birman empire, on the Irawaddy; 6 miles S.W. of Prone.

PADOR, a town of Africa, in *Damel*, on the Senegal. N. lat. 16° 40'. W. long. 14° 20'.

PADOUCAS, a western branch of the river Missouri. The inhabitants of its banks are called Padoucas, and are said to have been of Welsh origin.

PADRAMA, a small island near the coast of Sardinia. N. lat. 40° 38'. E. long. 9° 53'.

PADRAN BAY, a bay on the S.E. coast of Cochin-China. N. lat. 11° 24'. E. long. 108° 40'.

PADREAH, a town of Hindoostan, in Guzerat; 10 miles N. of Baroach.

PADROENS, a town of Portugal, in the province of Alentejo; 13 miles W. of Mertola.

PADRON, EL, a town of Spain, in Galicia, situated on the Ulla; anciently called "Iris Fluvia;" 15 miles S. of Santiago.

PADRON, Cape, a cape on the W. coast of Africa. S. lat. 6°. E. long. 12° 20'.

PADSHAWPOUR, a town of Hindoostan; 30 miles S. of Delhi.

PADSTOW, or **PETROCSTOW**, a market and sea-port town in the hundred of Pyder, and county of Cornwall, England, is situated on the west side of Padstow haven, near the mouth of the river Camel or Allan, which falls into the Bristol channel. It is distant 243 miles W.S.W. from London, and 30 miles W. by S. from Launceston. This town is of considerable antiquity, and is said to be the spot where St. Patrick founded the first religious house in Cornwall, when he arrived from Ireland in the year 432. It was first called Lodenick, and afterwards Adelstow, from king Athelstan, who, according to tradition, conferred many privileges on the inhabitants. The market-day here is on Saturday, weekly, and here are two fairs during the year. The harbour is among the best on the north coast, though much obstructed by sand, except in the middle channel, by which vessels of large burden may enter, and find a commodious anchorage. Padstow is governed by a portreeve, assisted by a certain number of the most respectable inhabitants. Its chief support is derived from the share it possesses in the pilchard fishery, and the custom of the numerous small vessels which resort to the harbour in the event of contrary winds, or strefts of weather. Humphrey Prideaux, the learned dean of Norwich, author of the "Connection of the Old and New Testaments," was a native of this town. According to the parliamentary returns of 1811, the parish of Padstow contains 237 houses, and a population of

1498 persons. Beauties of England and Wales, vol. ii. by E. W. Brayley, and John Britton, F.S.A.

PADUA, a city of Italy, and capital of the Paduan, on a small river, which runs into the Brenta. The right of citizens was granted to it by the Romans, and they allowed it to choose a senate. It was destroyed by Atila, repaired by Narses, and again destroyed by the Lombards; it was often ravaged, and as constantly re-established. In 1406, it was taken from the dukes of Milan by the Venetians, and the territory annexed to their republic. Padua is a place of considerable extent, containing 26 parishes, 4 hospitals, 41 convents, 7 gates, 7 stone bridges, 9 squares, and a great number of beautiful edifices or palaces: nevertheless it is poor, and the streets are in general narrow, dark, dirty, and ill paved. The university was founded by Charlemagne, and much enlarged by the emperor Frederic II, and pope Urban IV., but it has lately declined much from its former reputation. Padua is the see of a bishop, suffragan of Udina. The cathedral is well-built. The church of St. Antony, the patron of the city, is large and beautiful. The town-house was built on the ruins of the ancient senate-house, and is a grand structure. This city is fortified and governed by a podestat. The number of inhabitants is estimated at 38,000. This is an ancient town, and some have pretended that it was built by Antenor, after the destruction of Troy; 22 miles W. of Venice. N. lat. 45° 24'. E. long. 10° 52'.

PADUAKANS, in *Sea Language*, a name given by the Macassars to their proas. See **PROA**.

PADUAN, in *Geography*, a country of Italy, bounded on the N. by the Trevisan, on the E. by the Dogado of Venice, on the S. by the Polesino, and on the W. by the Vicentin; about 35 miles from N. to S., and 28 from E. to W.; being formerly a part of Lombardy. The air is salubrious, except in a few places situated near the salt marshes. The land is flat, and the eminences are hillocks rather than mountains, and produce grapes of excellent flavour, oranges, and other fruit, exclusively of corn, hemp, rice, various fruits, and all kinds of vegetables. The aspect of the country presents plantations of vines. Here are also commons for the rearing of cattle, and mulberries for the culture of silk, which yields a considerable trade. Upon the whole we may observe, that this country has been denominated a second paradise, and the garden of Europe. The number of inhabitants has been estimated at 300,000. The rivers Adige, Brenta, Bachiglione, and Musona, though they sometimes do injury by overflowing their banks, contribute to the enrichment of the country, particularly by promoting navigation and commerce, and by giving motion to a number of mills. This country, which in 1405 became subject to the dominion of Venice, followed its fate, under the new arrangement of the French revolution, in being annexed to the kingdom of Italy. The principal places are Padua, Anguilara, Arqua, Campo S. Pietro, Citradella, Este, and Montefelice.

PADUAN, among *Medalists*, a modern medal made in imitation of the antique; or a new medal struck with all the marks and characters of antiquity.

The name is taken from *Paduanus*, a famous Italian painter, who succeeded so well in the imposture, if it may be so called, that the best judges are at a loss to distinguish his medals from the genuine ones.

This Paduan was thus called from the place of his birth, Padua; his proper name was Giovanni Cavino; others say, Lewis Lee; he flourished in the seventeenth century. Gotheb Rink adds, that he had an associate in this forgery, called Alexander Bassianus. His son Octavian, though born at Rome, was also called the *Paduan*.

PADUAN is properly applicable to those medals only,

which are struck on the matrices of the elder Paduan; which are still preserved. Though it is frequently used in the general for all medals of this kind.

Joubert observes, that there have been a Paduan and Parmesan in Italy, and a Carteron in Holland, who had the knack of imitating the antique in perfection. The Parmesan was Laurentius Parmesanus. We may also add another Italian who excelled in this way, viz. Valerius Bellus Vicentinus; but his medals are not so common as those of the rest.

PADUANINO, **DARIO**, in *Biography*. His real name was Dario Varotorj, but he is better known under the one by which we have designated him. He was born at Verona in 1539, and at first attached himself to the study of architecture; but afterwards received instructions in painting from Paul Veronese, and became a very skilful artist. His fame rests principally upon the pictures he painted for the churches in Padua and in Venice, but there are many very graceful and agreeable productions of his upon a smaller scale scattered about, and some few are found in this country. They indicate a lively and brilliant, though not a profound genius, and exhibit the gay effect of the Venetian style, which he adopted in a pleasing manner.

He was renowned for his piety as well as for his ingenuity; and in the act of returning thanks at the shrine of the Virgin, in Padua, for having been miraculously preserved when a scaffolding had broken and fell with him, he was smitten with apoplexy, and died at the age of 57, anno 1596. He left a son, Alexander Varotori, called also Paduanino, who was not so successful as his father, though he was not without merit. He died in 1650, at the age of 60.

A daughter also of Dario's excelled in portraiture. Her name was Chiari, and she is highly praised by Rodolfi.

PADULA, in *Geography*, a town of Naples, in the province of Otranto; 4 miles N. of Nardo.—Also, a town of Naples, in Principato Citra; 14 miles N. of Policastro.

PADUS, in *Botany*, a name borrowed from Theophrastus, who gives no other account of his *παδος*, than that it greatly delights in a shady situation, like the Yew, and another plant which he denominates *θεραπευαλος*, and which some have guessed to be the Guelder-rose, *Viburnum Opulus*. *Padus* is now applied to the Bird Cherry, *Prunus Padus* of Linnæus; a tree to which the above account is hardly suitable, but which is nevertheless considered as the plant of Theophrastus by his recent commentator Mr. Stackhouse.

PADUS, in *Ancient Geography*, the *Po*, a river of Gallia Transpadana, commencing towards the W. at mount Vesalus and running eastwards, so as to discharge itself into the Adriatic gulf by many mouths, in which case the Greeks called it "Eridanos" or "Eridan." The origin of the name has been traced by etymologists to a corruption of the Celtic "boden," whose root is "bod" or "pot," and refers to its height and depth. According to Pliny the Po received 30 rivers; but Cluvier reckons as many as 40; under which number they must have comprehended many torrents, which become dry in summer.

PADUTI, in *Geography*, a town of Naples, in Calabria Citra; 4 miles E. of Rosano.

PÆAN, *παιων*, in *Antiquity*, a hymn in honour of Apollo, or some other of the gods; chiefly used on occasion of victory and triumph. They were sung in the procession at the Panathenaia.

Festus derives the word *απο του παιων*, *ferire, to smite, shoot*: but Hefychius rather takes Apollo to have been denominated *Pæan*, from *παιω, θεραπευω, I heal*; in allusion to his being the deity of medicine.

The

The Pæan took its name from Apollo himself; who was denominated *Pæon*; because in his combat with the serpent Python, his mother Latona encouraged him to make use of his arrows, by crying frequently, *ἦ παι, ἦ παι, do boy, bravely boy.*

PÆAN or *Pæon* is also a name of a foot in the ancient poetry; so called, as commonly supposed, because appropriated to the hymn Pæan; though Quintilian derives the name from its inventor *Pæon*, a physician. There were four kinds of feet called Pæans.

The first Pæan consists of four syllables, one of which is long, and the rest short, as *colligere*; the second is composed of a short, a long, and two shorts, as *resolvere*; the third of two long, a short, and a long, as *communicant*; and the fourth of three short and one long, as *temeritas*.

PÆCILIA, in *Ichthyology*, a name given by Schoneveldt, and some others, to the fish called by most authors the *mustela fossilis*. It is properly a species of *cobitis*, and is called by Artedi the *blucisb cobitis*, with five longitudinal black lines on the body. See *COBITIS Fossilis*.

PÆDARTHROCAE, from *παις*, a child, *αρθρον*, a joint, and *κακος*, an evil, in *Surgery*, a scrofulous swelling of a joint; a disease to which children are particularly subject.

PÆDERIA, in *Botany*, appears to have been so called by Linnæus from *Pæderos*, an opal, in allusion to the transparency and changeable colour of its berry. Linn. Mant. 7. Schreb. 161. Willd. Sp. Pl. v. 1. 1219. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 63. Juss. 205. Lamarck Illustr. t. 166.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Rubiaceae*, Juss.

Gen. Ch. Cal. Perianth superior, of one leaf, turbinate, with five teeth, permanent. Cor. of one petal, funnel-shaped, hairy internally; limb in five small segments. Stam. Filaments five, awl-shaped, various in length, from the middle of the tube; anthers oblong, incumbent. Pijl. Germen roundish, inferior; style capillary, cloven, the length of the corolla; stigmas simple. Peric. Berry small, ovate, inflated, brittle. Seeds two, ovate.

Ess. Ch. Corolla funnel-shaped, hairy within. Berry inflated, brittle, with two seeds. Style cloven.

1. *P. fatida*. Stinking Opal-berry. Linn. Mant. 52. Banks Icon. Kæmpf. t. 9. Lamarck f. 1. (*Convolvulus fœtidus*; Rumph. Ambon. v. 6. 436. t. 160.)—Leaves ovato-lanceolate, or somewhat heart-shaped. Panicles cymose. Germen smooth. Corolla externally downy.—Native of China, the East Indies, and the island of Mauritius. A climbing shrub, with long, smooth, slender, twining, compound, leafy branches, spreading to a great extent over the neighbouring bushes and trees. Leaves opposite, on long roughish stalks, lanceolate, pointed, entire, various in breadth, more or less ovate or rounded at the base, sometimes heart-shaped. Stipulas within the footstalks, short, triangular, deciduous. Panicles axillary, compound, forked, cymose, slender, more or less downy. Bractæas small, membranous, jagged. Germen and calyx smooth and shining, small. Corolla about half an inch long; externally downy and greyish, internally of a deep purplish brown, lined with hairs. Berry the size of a currant, globose or oblong, crowned with the calyx, smooth, shining, very brittle, pale green and semitransparent, finally yellowish. Rumphius says the leaves are very fœtid when rubbed, or when the sun shines upon them, inasmuch that those who pass by where the plant grows, are greatly annoyed with the smell. This odour is of a stercoraceous kind, like that of another plant of the same natural order, *Ernodea montana*, Sm. Prodr. Fl. Græc. Sibth. v. 1. 98. (See *ERNODEA*.) We have seen the *Pæderia* in the stoves at Paris in 1786, and have per-

ceived this smell. This plant is said to have been brought to Kew in 1806, but has not yet flowered. One of Linnæus's specimens from China, on which the shining berries though dried are very beautiful, has heart-shaped leaves, exactly like Kæmpfer's plate, with very downy stalks both to the leaves and flower. Most specimens accord with the figures of Rumphius and Lamarck; yet we do not see sufficient grounds to distinguish theirs as a species, from that of Kæmpfer.

2. *P. fragrans*. Fragrant Opal-berry. Lamarck Dict. v. 2. 260. Illustr. t. 166. f. 2. Willd. n. 2.—Leaves elliptical. Panicles corymbose. Germen downy. Tube of the corolla smooth. Gathered in woods in the island of Mauritius, by Commerçon, who taking it for a new genus, named it *Danais*, in allusion to the history of the *Danaïdes* who murdered their husbands, "because," says he, "where the flowers of this plant are luxuriant, the male or the female organs are rendered abortive." This is abundantly distinct from the first species, in its more elliptical and brighter-coloured leaves; but more especially in its corymbose downy panicles, downy germen and calyx, and longer, more slender, corolla, whose tube is quite smooth, even though the limb be sometimes slightly hairy at the back. The flowers are said to have the scent of a *Narcissus*, but even more delightful; their colour is red. Commerçon describes the fruit as globular.

PÆDEROTA. See *HEMIMERIS* and *WULFENIA*. The name is ancient, and has been applied by some to a species of *Teucrium*, by others to the *Acanthus spinosus*.

PÆDO-BAPTISM, a compound of *παις*, *παιδης*, infant, and *βαπτισμα*, baptism, infant baptism, or that conferred on children. See *BAPTISM*.

PÆDO-BAPTISTS, formed of *παις*, *παιδης*, infant, and *βαπτίζω*, I baptize, are those who maintain that baptism should be administered to infants. In support of this opinion, they plead, that if infants, under the Christian dispensation, were excluded from the privilege of baptism, the Christian institution must appear, in this respect, to be less complete and perfect than that of the Jews: and it is not likely, by arguing *à priori*, that God would appoint an external sign of peculiar distinction and benefit for children under the patriarchal and Jewish constitution, without any similar appointment under the Christian dispensation; more especially as the first profelytes to Christianity, and those in particular who were converted from among the Jews, would naturally expect some token of distinction and privilege, comprehending their children, and resembling in its design, though milder in its nature, that which Christianity had abrogated. This expectation was farther encouraged by the very condescending and affectionate manner in which our Lord expresses himself concerning infants; particularly when he says, Mark x. 14. "Of such is the kingdom of God;" which some understand to signify, that the rights and privileges of the Christian church belong to such. With these views, it is easy to conceive to what subjects they would apply the general charge to baptize profelytes, unless they had been directed and restricted by some express order.

An order of limitation was absolutely necessary to prevent their mistaking the proper subjects of baptism, and misapplying this ordinance, if infants were to be excluded. This would be the more likely, as they would explain the precepts of Christ, concerning baptism, by the custom prevailing among the Jews, in his time: and as it was the practice, when profelytes came over to the Jewish religion, to baptize the children with the parents, the apostles would naturally conclude, that children were included in the general commission. Matt. xxviii. 19.

Mr. Wall has endeavoured to shew, from the books of the Jews themselves, and those of others, that understood the Jewish customs, and have written concerning them, that it was the custom of the Jews before our Saviour's time, and, as they affirm, from the beginning of their law, to baptize as well as circumcise any proselyte that joined them from other nations, and with him, at his desire, his infant children likewise.

Moreover, the advocates for infant baptism urge more directly the argument from circumcision after this manner: the covenant made with Abraham was a covenant of grace, by which spiritual and eternal blessings were promised to him (see Matt. xxii. 31, 32. Heb. xi. 6. Rom. iv. 11—17. Gal. iii. 6.—18. 29.) and as such comprehended both Jews and Gentiles, and their seed. Circumcision was instituted by God as a token of that covenant, and as such, he commanded that it should be administered to the infant offspring of his covenant people. Gen. xvii. 1—4. And yet, though the covenant endureth, that ancient token of it is abolished; nor is there any external sign or seal of it, under the Christian dispensation, except baptism. We have, therefore, reason to think, that this ordinance was intended to succeed circumcision, as it resembles it in many respects, and seems to be called the circumcision of Christ, by the apostle Paul, Col. ii. 11, 12. And inasmuch as circumcision was administered to infants, in token of this covenant, baptism, being its substitute and antitype, ought to be administered to infants likewise. Consult Acts, ii. 39. Rom. xi. 17, &c.

Another argument for infant baptism is deduced from the words of the apostle, 1 Cor. vii. 14. which are supposed to have a direct reference to infant baptism; because *holy* often signifies those that might be admitted to sacred rites, and *unclean* such as were to be excluded from them. Doddr. in loc.

The Pædo-baptists acknowledge that there is no direct and express command to baptize infants; but appealing to the history of the administration of baptism, they argue, that the apostles are said to have baptized whole families, (Acts, xvi. 15. 33. 1 Cor. 1. 16.), and, therefore, probably infants, comprehended under this general denomination. And they apprehend, that they have been able to trace such intimations at least of infant baptism, in the earliest ages of the church, as may, to a high degree of probability, prove it to be an apostolic, and consequently divine institution.

Irenæus, who was born about the time of St. John's death, and probably of Christian parents, mentions infants among the regenerate, *i. e.* the baptized, as the word generally signifies in his writings.

Justin Martyr, about forty years after the time of the apostles, speaks of some who had been *made disciples* from their infancy.

Tertullian, about one hundred years after the apostles, though he advises parents to defer baptizing their children, except when their lives were in danger, speaks of the practice as generally received and observed in his time.

Cyprian, about one hundred and fifty years after the apostles, is allowed by all to speak expressly of infant baptism, as generally used in the church; and we learn, that, in his time, A. D. 253, a question being agitated among sixty-six bishops, in the council of Carthage, Whether an infant must be kept till he was eight days old before he be baptized, all unanimously gave their opinion to the contrary.

There are many passages that expressly refer to infant baptism in the works of Origen, who was born of Christian parents; and as his father was martyred in the year 202, when he was seventeen years old, the remoter Christians of

his family must have been nearly contemporary with the apostles.

In the Apostolic Constitutions, which are allowed to be very ancient, express mention occurs of infant baptism, as commanded by Christ. Matth. xix. 14.

The learned Wall, who took great pains in this inquiry, informs us, that, in the first four hundred years after the apostles, there appears to be only one, *viz.* Tertullian, who, in some cases, advised the delay of infant baptism; and another, *viz.* Gregory, who practised such delay in the case of his own children: but no society of men adopted this opinion, nor did any one person pretend to say it was unlawful to baptize infants: and in the next seven hundred years, there is not so much as one man to be found, that either spoke for or practised any such delay; and, if truth were to be determined by numbers, the general and uniform practice of the Christian church is very much in favour of infant baptism.

On the other hand, the Baptists plead, that infants are incapable of complying with the terms required in order to baptism, *i. e.* repentance and faith, and of receiving those instructions which Christ directed, as previous to it. Matt. xxviii. 19. compared with 1 Peter, iii. 21. But the Pædo-baptists reply, that those instructions and conditions were required only of those who were capable of them. Besides, the word *μαθητεύσατε*, which some understand of *teaching*, previous to baptism, may signify *make disciples*: and that infants may be comprehended under that name, some have argued from Acts, xv. 10. The word used by Justin Martyr, in the passage above cited, and applied to infants, is *εμαθητεύσαν*. And it has been farther alleged, that the penmen of scripture, and other Christian writers, have commonly used the word to signify the reception of any one to the number and degree of disciples, as preparatory to subsequent instruction; so that persons, thus received in order to be taught, were, before the instruction itself, denominated disciples. Compare Luke, ix. 57. and Matt. viii. 19, 20, 21. Eusebius Evang. Demonst. lib. iii. sect. 7. where he styles those who were desirous of learning of Christ, his disciples.

It is farther objected, that infants are incapable of receiving any benefit from baptism; and that, in this case, the ordinance is exposed to contempt. The Pædo-baptists reply to this objection, by maintaining, on the contrary, that there are many advantages resulting from baptism administered to infants, both to them and principally to their parents, whose immediate act it is; that an ordinance, as in the case of Christ, who was himself baptized, may sometimes be administered to those who are not capable of *all* the purposes for which it was originally instituted, and which it may subserve with regard to others; and still farther, that this argument against baptizing infants, by proving too much, proves nothing: for if infants are incapable of the ends of baptism, under the Christian dispensation, infants under former dispensations were equally incapable of the ends of circumcision; and, therefore, such an institution was useless and improperly enjoined.

The objection founded on the silence of the New Testament, with regard to infants as the subjects of baptism, is already answered, in the beginning of this article, and the objection retorted against the Baptists themselves. The history of the practice of baptizing infants has been already stated; and though it is urged, that Justin Martyr contends for a profession of faith as necessary in order to baptism, whence was derived the use of sponsors, in the case of infants, it is answered by the Pædo-baptists, that Justin speaks of the adult, or may consider the confession of the sponsor

as the child's, being made in his name: and this is the more probable, as the subsequent fathers use the same language long after infant baptism was the prevailing practice.

The Pædo-baptists also differ from the Baptists as to the mode of administering the Christian ordinance. The former perform it by sprinkling or pouring on water; the latter, by the immersion of the whole body, which they contend to be an essential circumstance. In favour of immersion it is pleaded, that the word βαπτίζω, being derived from βαπτίω, properly signifies *to plunge*: on the other hand it is urged, that in this diminutive and derivative form it may signify any method of washing, and is sometimes used in scripture for washing things which were not dipped in water, but on which it was poured. Compare Luke, xi. 38. Mark, vii. 4. and those passages in which the pouring out of the spirit is called baptism, Acts, i. 5. ch. xi. 15, 16; to which some add, 1 Cor. x. 2. observing that βαπτίω is never used for baptism.

Farther, the Baptists argue, that John performed his baptism by immersion, and that his practice is obligatory upon all Christians. To this some have replied, that John's baptism is distinguished from Christian baptism, and that some, who had received his baptism, were again baptized in the name of Christ. (Acts, xix. 3, 4, 5.) And, therefore, that his example does not bind Christians. However, it is at least doubtful whether John, who was of the line of the priests that had been always used to perform their purifications by sprinkling, did really baptize by immersion. On the affirmative it is urged, that we read of his baptizing (εἰς) in Jordan: but to this is answered, that εἰς signifies *by, at, or with*, and consequently furnishes no proof that John plunged his disciples into the river of Jordan. It is farther pleaded, that he chose a place for this purpose, where there was much water; and this he might have done, for the convenience of sprinkling as well as of plunging, considering the numbers that resorted to his baptism, Matt. iii. 5. It is improbable, that such multitudes of both sexes, and at a distance from their own habitations, should be baptized in any other mode.

Another argument, in favour of immersion, is drawn from the account of Philip and the eunuch, Acts, viii. 38, 39, who went down (εἰς) into the water; and, after the baptism, they are both said to come up (εἰς) out of the water. But many passages might be cited, where εἰς signifies *to or unto*, and ἐκ, *from*. Matt. xv. 24. chap. xvii. 27. chap. iii. 11. John, ix. 1. 2 Cor. v. 1. Rev. xix. 5.

It is farther argued, that plunging alone represents our being buried with Christ in baptism, and consequently that this ceremony is essential. Compare Rom. vi. 4. Col. ii. 2. The Pædo-baptists, though they allow that there is in these passages an allusion to the mode of baptism which then generally prevailed, maintain, that in the institution of the ordinance, there is no declaration that it was chiefly designed to represent this, and persons were baptized before it was generally known that Christ should die and arise from the dead. Our being cleansed from sin seems to be the thing primarily intended, which may well be represented by pouring on water; and as this more naturally represents the pouring out of the spirit, the sprinkling us with it, and the sprinkling of the blood of Jesus, it may answer as valuable purposes as that mode, which, more directly, represents death and a resurrection.

The most considerable argument in favour of immersion is, that it was practiced in the primitive ages. Several texts in the New Testament, say the Baptists, plainly declare this. (Matt. iii. 6. 16. John, iii. 23. Acts, viii. 36—39.) But from these passages, the Pædo-baptists reply, that no certain

conclusion in favour of immersion can be drawn; nor from the subsequent history of the Christian church. Though they allow that immersion might be used, there are some cases in which it is more probable that the mode of baptism was sprinkling; partly on account of the number baptized at once, and partly because many of them were strangers, and far from their own habitations, and therefore destitute of that change of raiment which decency, conveniency, and safety, would have required. We might add farther, that baptism by sprinkling is, in its nature and the circumstances attending it, more suitable to the mild and benign genius of Christianity, and to the designed extent of its spread through all the various climates of the earth, than baptism by immersion. See, on this subject, Wall's History of Infant Baptism, 4to. 1707. Wall's Defence of the History against Gale, &c. 8vo. 1702. Towgood's Baptism of Infants a reasonable Service. Fleming's Plea for Infants, &c. &c.

For a summary of the principal arguments in favour of baptizing adults, and by immersion, see BAPTISTS.

PÆDOPHLEBOTOMIA, from παις, and φλεβοτομία, *venesection*, in *Surgery*, the operation of venesection practiced on a child.

PÆDOTHYSIA, παιδοθυσία, in *Antiquity*, an inhuman custom, that prevailed amongst the ancient heathens, of sacrificing their children. Thus it is related in the scriptures, that the king of Moab, being besieged by the Israelites in his capital, and reduced to great straits, took his eldest son, that should have reigned in his stead, and offered him for a burnt offering upon the wall, on which the siege was raised. 2 Kings, iii. 27.

From Phœnicia this cruel practice passed into Europe and Africa, and spread itself far and wide; and it is reported, that the Mexicans are, at present, guilty of it.

PÆNA, in *Ancient Geography*, an island of the Atlantic ocean, west of the province of Tingitana. Ptolemy.

PÆNOE, in *Botany*, the name of a very large tree, which grows in Malabar.

The resin, discharged from the root, bark, fruit, and other parts of this tree, when boiled with oil, is used either for a hard or liquid pitch; and is, in the Indian sacrifices, sometimes burnt instead of incense.

The kernels of the fruit when bruised, and, in conjunction with warm water, levigated on a marble, corroborate the stomach, remove a nausea and vomiting, allay racking pains of the belly, and cure the cholera. The resin of this fruit, when melted with the oleum sesami, is an excellent vulnerary balsam; when reduced to a powder, and exhibited, it also powerfully cures a gonorrhœa, and other vulnerary symptoms. Ray.

PÆNULA, or PENULA, among the Romans, a thick short, close-bodied garment, fit for a defence against cold and rain.

PÆONES, in *Ancient Geography*, a people who inhabited the coast of Macedonia and mount Rhodope, according to Dion Cassius. Herodotus places them on the banks of the Strymon; and Ptolemy assigns to them for their habitation Macedonia, towards the sources of the river Haliacmon.

PÆONIA, a country of Macedonia, which, according to Pausanias, took its name from Pæon, the son of Endymion. Herodotus speaks of this country, as subject to Darius, son of Hytaspes. It was situated east of the Axius, and west of Strymon.

PÆONIA, in *Botany*, the Pæony, so named by the ancients, in memory of Pæon the physician, whom Homer records as having cured Pluto with this herb, when he was wounded by

by Hercules. We presume its virtues are altogether reserved for such august occasions, they having never been made manifest on any other, as far as we can learn. The *raison* of Dioscorides evidently appears, by his very particular description, to be our plant. What he distinguishes, by the gratuitous appellation of male and female, are now acknowledged to be two species; though Linnæus considered them as varieties of one, by the name of *P. officinalis*. Linn. Gen. 273. Schreb. 365. Willd. Sp. Pl. v. 2. 1221. Mart. Mill Dict. v. 2. Ait. Hort. Kew. ed. 2. v. 3. 315. Sm. Prodr. Fl. Græc. Sibth. v. 1. 369. Juss. 234. Tourn. t. 146. Lamarek Illustr. t. 481. Gært. t. 65.—Class and order, *Polyandria Pentagynia*. Nat. Ord. *Multifloræ*, Linn. *Ranunculaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of five small, roundish, concave, reflexed, permanent leaves, unequal both in size and insertion. *Cor.* Petals five, roundish, concave, contracted at the base, spreading, very large. *Stam.* Filaments very numerous, (about three hundred), capillary, short; anthers erect, large, oblong, quadrangular, of four cells. *Pist.* Germens two or more, ovate, erect; styles none; stigmas compressed, oblong, obtuse, coloured. *Peric.* Follicles as many as the germens, ovate-oblong, spreading widely, often downy, coriaceous, bursting lengthwise at their inner edge. *Seeds* numerous, oval, polished, coloured, ranged along each margin of the future.

Eff. Ch. Calyx of five leaves. Petals five. Styles none. Follicles superior, with many marginal seeds.

Obs. Linnæus remarks, that though the most natural number of the germens is, in his opinion at least, two, they are often more numerous; but he thinks they scarcely ever amount to five. Some newly discovered species however contradict this, and indeed most of the old ones afford reasons, at one time or other, for the union of the Linnæan orders from *Digynia* to *Pentagynia*, in the class *Polyandria*, into one; which is sanctioned also by *Delphinium*, *Aconitum*, and others. See Sm. *Introd. to Botany*.

1. *P. Moutan*. Chinese Tree Pæony, or Moutan. Ait. n. 1. Sims in Curt. Mag. t. 1154. (*P. suffruticosa*; Andr. Repof. t. 373 and t. 448.)—Stem woody, perennial. Leaflets oblong-ovate; glaucous and somewhat hairy beneath; the terminal one three-lobed. Germens numerous, distinct.—Native of China, where it is one of the most favourite objects of horticulture, as may be seen by the paper-hangings, screens, porcelain, and other ornamental productions of art, brought from that country. It is depicted on such with double blossoms, either of a rose-colour, crimson, purple, white, or even of a golden yellow. The first only has been introduced into this country, by Sir Joseph Banks, in 1789. Collectors who have had means of communication with China, particularly the late Right Hon. Charles Greville, and Sir Abraham Hume, have anxiously endeavoured to obtain some of the other varieties, but in vain; except that the gentleman last mentioned has procured a shrubby Pæony with a single flower, more beautiful than the double, of which we shall presently speak as a distinct species. The *Moutan* proves tolerably hardy in England, though, like many other plants from the same country, which blossom early in our spring, it requires the protection of a glass frame at that season. The shrubby *stem* is peculiar to this and the next species, among all those hitherto known, and forms a large bush, spreading several feet in diameter. *Leaves* on long stalks, alternate, large and spreading, twice or thrice ternate in an opposite manner, deciduous; their leaflets tapering at the base, acute, entire, occasionally lobed, veiny; glaucous and very sparingly hairy beneath;

the terminal ones three-lobed. The scales of the *leaf-buds* are pale crimson. *Flowers* terminating the branches, solitary, six or eight inches broad, known to us in a very double state only, consisting of innumerable jagged rose-coloured *petals*, with a few *stamens*, with yellow *anthers*, remaining unchanged, and a greater or less number of *germens*, all separate and distinct. The smell of the *flower* is generally unpleasant, but a sweet-scented variety, of the same colour, is cultivated by Messrs. Lee and Kennedy. It is strange, and scarcely credible, that Thunberg and Loureiro should have thought this shrub a mere variety of our common *P. officinalis*. The latter indeed suspects that some of the supposed varieties of this plant, which, for many hundred years, are said to have been cultivated in China, are probably species. We are as yet much in the dark respecting these, but they seem by the drawings of the Chinese, to differ only in the colour of their blossoms. That whimsical people are reported to take pleasure in budding the different colours on the same stem.

2. *P. papaveracea*. Poppy-fruited Pæony. Andr. Repof. t. 463.—Stem woody, perennial. Leaflets oblong-ovate; glaucous and slightly hairy beneath; the terminal one three-lobed. Germens about six, closely combined into a globe. This blossomed in 1808 in the fine collection of the late lady Amelia Hume, at Wormleybury, having been introduced a year or two before, from China. It differs in no respect, as to *stem* and *foliage*, from the preceding. The *flowers* however differ, in being nearly single, with scarcely more than five *petals* which are very large, white or blush-coloured, with a large purple spot, at the base of each, vying with the beauty of a Gum Cistus. The *stamens* also are copious and all perfect. But the most remarkable difference exists in the *pistil*, which consists of six *germens*, rarely more, all closely compressed together into a globe, like a Poppy-head, and even enveloped in one common integument. The appropriate number of *stigmas*, one to each germen or cell, crowns this globe. Whether this can possibly be a variety, is doubtful. Dr. Sims is induced to consider it, if natural, as amounting to a generic distinction. This the exact conformity of all the other parts forbids, especially as there are similar specific differences in other genera; see NIGELLA. The character in question is found constant in all the specimens of this fine plant, that, for several successive years, have fallen in our way.

3. *P. officinalis*. Common Pæony. Willd. n. 1. Ait. n. 2. Retz. Obs. fasc. 3. 35. Linn. Sp. Pl. α . 747. Buliard t. 101. (*P. fœmina*; Matth. Valgr. v. 2. 266. Fuchs. Hist. 202. Lob. Ic. 682. f. 2. Ger. em. 981.)—Leaves twice compound; leaflets with broadly-lanceolate lobes. Follicles downy, nearly upright.—Native of shady groves in Switzerland, as well as on the mountains of Crete and Greece. It has been as long cultivated in European gardens, as perhaps any other exotic, flowering in May and June. The *root* is perennial, with many fleshy, cylindrical, or elliptical knobs, black externally. *Stems* herbaceous, annual, two feet high, with large, spreading, compound, dark-green *leaves*, mostly smooth and naked underneath, as well as above. *Flowers* terminal, solitary, crimson, usually double in gardens. There is an elegant flesh-coloured variety, as well as a white one. This is certainly the *raison* *ϑηλια*, or female Pæony, of Dioscorides, so named, of course, without any idea of the real sexual distinctions, in the parts of fructification. He celebrates it as useful in promoting natural discharges when deficient, and restraining some of them when too abundant. The flavour of the root is acrid, bitter and fœtid, and its qualities are reported to be narcotic

PÆONIA.

and dangerous, which we can readily believe. Bulliard's plate seems intended for this, though he did not distinguish it from the following very distinct species.

4. *P. corallina*. Entire-leaved Pæony. Willd. n. 2. Ait. n. 3. Retz. Obf. fasc. 3. 34. Engl. Bot. t. 1513. (*P. officinalis*; Linn. Sp. Pl. β. 747. Mill. Illustr. t. 47. *P. mas*; Ger. em. 980. Lob. Ic. 684. Matth. Valgr. v. 2. 265).—Leaves twice ternate; leaflets ovate, undivided. Follicles downy, recurved.—Native of the south of Europe. Dr. Sibthorp had wild specimens communicated to him by an apothecary of Zante. It was also discovered, in a wild state, by Francis Bowcher Wright, esq. in the rocky clefts of the island called Steep Holmes, in the Severn, in August 1803, whence this species has found a place in *English Botany*. Gerarde says he found it at Southfleet, Kent, which his editor Johnson rudely denies. Rustic gardens often abound with this flower, in its proper single state; the seed-vessels being admired, and long preserved for the decoration of the cottage chimney-piece, on account of their shining pink inside, and black polished seeds, contrasted with the red remains of numerous abortive ones, ranged along the edges. This is the *παριον αρρυν*, or male Pæony, of Dioscorides, whose leaves he compares to those of a Walnut-tree, a sufficient indication of their ovate, undivided, simply pinnate form, by which the species is clearly distinguishable from the last. The qualities of the two plants probably differ but little. We find the leaves of the present sometimes downy beneath.

5. *P. peregrina*. Crimson-flowered Small Pæony. Ait. n. 4. Sims in Curt. Mag. t. 1050. (*P. promiscua*; Ger. em. 982. Lob. Ic. 683. *P. byzantina*; Ger. em. 982?)—Leaves twice ternate; leaflets elliptic-oblong, decurrent, lobed; glaucous and hairy beneath. Follicles erect, downy.—Native, probably, of the south of Europe. It is a plant of much humbler growth, and smaller dimensions, than any of this genus that we have hitherto mentioned, and is essentially distinguished, if we mistake not, by its decurrent leaflets, whose main ribs unite far above the base. The flowers are of an elegant, but not very deep or bright, crimson, scarcely three or four inches in diameter, often double, with linear internal petals, like a double anemone. Such is the plant we had from Mr. Loddige by the name of *P. humilis*, with whose figure and description it, as Dr. Sims well remarks, does not at all agree. But neither, in our judgment, does it accord with the *P. peregrina, flore coccineo*, Bell. Hort. Eyf. Vern. (not Ætiev.) ord. 6. t. 9, nor with *P. byzantina* of Gerarde, Parkinson and others, which is described by Parkinson as larger than the Male Pæony, *P. corallina*; whereas our *peregrina* is a great deal smaller, and exactly answers to the *promiscua* of old books. It appears to be rather of recent introduction among us, and we have some suspicion of its having been brought from Siberia. The flowers are produced in May or early in June, and the roots are quite hardy.

6. *P. daurica*. Glaucous Daurian Pæony. Ait. n. 10. Andr. Repof. t. 486.—Leaves pinnate; leaflets elliptical, obtuse, glaucous, somewhat wavy. Stem herbaceous.—Native of Siberia, from whence it was procured, in 1790, by the late Mr. Bell. This, like the rest, is a hardy perennial, flowering in May or June. Stem about two feet high. Leaves apparently all simply pinnate, glaucous on both sides, paler beneath; leaflets broadly elliptical, obtuse, concave, veiny, rather wavy at the edge. Flowers large and handsome, of a purplish rose-colour, with copious yellow stamens, and two pistils. Follicles ovate, divaricated, downy, about one inch and a half long. We know this species, which seems well worthy of general cultivation,

from Mr. Andrews's work only. Its affinity to the three preceding, has made us here swerve from the arrangement in the *Hortus Keavenfis*.

7. *P. albiflora*. White-flowered Pæony. Pallas. Ross. v. 2. 92. t. 84. Willd. n. 3. Ait. n. 5. Andr. Repof. t. 64. and t. 612.—Leaves twice ternate; leaflets elliptic-lanceolate, acute, entire, smooth. Capsules recurved, smooth. Calyx bracteated.—Native of Mongol Tartary, on grassy hills, and introduced into the British gardens by Pallas, its celebrated discoverer, in 1784. This flowers in May or June, and is hardy, but we do not find this species so easy of culture, nor so free in flowering, as some others. The inhabitants of its native country are said to eat the roots boiled in soups, and to mix the powdered seeds with the infusion or decoction of their tea. The stem is herbaceous, usually dark brown, smooth and polished. Leaves twice ternate, of a dark shining green above, paler beneath, quite smooth and naked. Flowers comparatively small, but peculiarly elegant in their native simplicity and snowy whiteness, with concave, partly closed, petals, and a brown calyx, accompanied by three green, leafy, sessile bractæas. Germens three or four, brown and smooth. These flowers have a sweet aromatic scent. There is a double variety, with a bluish-coloured tint, and yellowish inner petals, figured in Andrews's t. 612, which makes a very splendid appearance; but we have always admired the original plant, as one of the most desirable of its genus, nor are we singular in this opinion.

8. *P. humilis*. Dwarf Spanish Pæony. Retz. Obf. fasc. 3. 35. Willd. n. 4. Ait. n. 6. (*P. pumila fœmina*; Lob. Ic. 683. Ger. em. 982.)—Leaves twice ternate; leaflets in three deep linear segments, downy beneath. Follicles hairy, nearly erect. Clusius records this as a native of Spain. Gerarde speaks of it as known in the English gardens in his time. We have never met with a specimen, and should be very glad to see it well figured. Retzius describes the stem a foot and half high, simple, smooth, angular and green. Leaves in very narrow segments, acute; glaucous above; whiter and downy beneath. Petals of a deeper red than those of *P. corallina*, n. 4. Germens greenish, slightly hairy, as are also the short, nearly upright, follicles.

9. *P. anomala*. Jagged-leaved Siberian Pæony. Linn. Mant. 247. Willd. n. 5. Ait. n. 7. Andr. Repof. t. 514. (*P. laciniata*; Pallas. Ross. v. 2. 93. t. 85. *sibirica*. P. n. 14; Gmel. Sib. v. 4. 184. t. 72.)—Leaves twice ternate; leaflets with many lanceolate segments, smooth. Follicles depressed, smooth. Calyx bracteated. Frequent throughout most parts of Siberia, in grassy, shady, rather lilly spots. Mr. Bell introduced this first into England, and it flowered with him in July 1807. The calyx is accompanied with leafy bractæas, like those of *P. albiflora*, but longer and narrower, like the numerous lanceolate segments of the foliage, by which this species is distinguished at first sight from all we have hitherto described, except the last, but that has downy leaves, glaucous above, and hairy upright seed-vessels. The corolla of *P. anomala* is concave, of a full rose-colour. Germens usually five, spreading, smooth, as well as the follicles.

10. *P. hybrida*. Mule Pæony. Pallas. Ross. v. 2. 94. t. 86. Willd. n. 6. Ait. n. 8.—Leaves twice ternate; leaflets with numerous linear segments, smooth. Germens downy. Pallas mentions this as occurring now and then wild, in valleys on the banks of some of the larger Siberian rivers, but much smaller than the specimen delineated in his plate, which he says originated in the garden at Petersburg, and was supposed to be a hybrid production between the preceding species and the following, as it never produced seeds. Mr. Bell is recorded as having introduced *P. hybrida* into England,

PÆONIA.

England, in 1788. Like the last it is perennial, flowering in May, and like that, has the *leaflets* much divided, but with still narrower segments. The parts of fructification however more agree with *tenuifolia*, hereafter described. The *bracteas* are partly lacinated, as in that, not all undivided, as in *anomala* and *albiflora*. The *corolla* is of a deeper red, and the *germens*, instead of being smooth, are downy. It is very likely, though occasionally found wild, to be a mule plant, rather than a permanent intermediate species.

11. *P. tenuifolia*. Fine-leaved Pæony. Linn. Sp. Pl. 748. Linn. fil. Pl. Rar. fasc. 1. 9. t. 5. Pail. Ross. v. 2. 95. t. 87. Willd. n. 7. Ait. n. 9. Meerb. Ic. t. 25. Curt. Mag. t. 926. (P. n. 15; Gmel. Sib. v. 4. 185. t. 73.)—Leaves thrice ternate; leaflets in numerous linear-awl-shaped segments, smooth. Follicles hairy.—Native of Siberia, from whence the late Mr. Malcolm is said first to have obtained it alive in 1765. This is one of the most elegant species, and a highly desirable hardy herbaceous plant, flowering readily in the open border, about the end of May. The root creeps moderately. In a wild state the stem is said to be about a foot high; in a garden it is full two feet, erect, simple, or slightly branched, clothed with numerous, very compound and finely divided, dark-green, smooth leaves, spreading in a recurved direction. Flowers terminal, solitary, concave, rather above two inches wide, of a most vivid, deep, rich, shining blood-colour, with copious yellow stamens. The bracteas are partly divided like the leaves, partly entire. Germens densely covered with erect, close-set, plush-like, shining, brown, rigid hairs. We seldom see the seeds perfected in England, though they are said to ripen in Sweden. No wonder that Linnæus, who, when he first became acquainted with this beautiful Pæony, was full of his newly conceived ideas of hybrid generation in plants, immediately guessed it to be a mule between the common *Pæonia* and *Adonis apennina*. It does indeed look like a magnified *Adonis autumnalis*. Such resemblances are, nevertheless, fallacious, and there is no real foundation for believing the *P. tenuifolia* any other than a most distinct and permanent original species.

PÆONIA, in Gardening, comprises plants of the large, herbaceous, showery, perennial kind, of which the species are, the common pæony (*P. officinalis*), and the slender-leaved pæony (*P. tenuifolia*).

There are two principal varieties of the first species; the common female, and male pæony.

The former of these has the roots composed of several roundish thick knobs or tubers, which hang below each other, fastened with strings; the stalks are green, about two feet and a half high; the leaves are composed of several unequal lobes, which are variously cut into many segments; they are of a paler green than those of the latter sort, and hairy on their under side; the flowers are smaller, and of a deeper purple colour.

The latter has the roots composed of several oblong knobs hanging by strings fastened to the main head; the stems the same height with the preceding; the leaves are composed of several ovate lobes, some of which are cut into two or three segments; they are of a lucid green on their upper side, but are hoary on their under; the stems are terminated by large single flowers, composed of five or six large, roundish, red petals.

The flowers in both sorts appear in May, and are natives of several parts of Europe.

And Miller suggests, that it is scarcely necessary to observe that the old names of male and female have nothing to do here with sexes, the flowers of both being hermaphrodite.

Besides, there are several sub-varieties of the female pæony,

as with double flowers, differing in size and colour, cultivated in gardens. The male pæony also varies, with pale and white flowers, and with larger lobes to the leaves: they also vary much in different countries.

As there is the *Foreign Pæony*, with a deep red flower; the roots are composed of roundish knobs, like those of the female pæony; the leaves are also the same, but of a thicker substance; the stalks do not rise so high; the flowers have a greater number of petals, and appear a little later. This is a native of the Levant. The large double purple pæony is probably a sub-variety of this.

The *Hairy Pæony*, with a larger double red flower; the roots like the common female pæony; but the stalks taller, and of a purplish colour; the leaves much longer, with spear-shaped entire lobes; the flowers large, and of a deep red colour.

The *Tartarian Pæony*, with roots composed of oblong fleshy tubers of a pale colour; the stalks about two feet high, pale green; the leaves composed of several lobes, irregular in shape and size, some having six, others eight or ten spear-shaped lobes, some cut into two or three segments, and others entire; of a pale green, and downy on their under side; the stalks are terminated by one flower of a bright-red colour, a little less than that of the common female pæony, having fewer petals.

The *Portugal Pæony*, with a single sweet flower, has not roots composed of roundish tubers, but has two or three long taper-forked fangs like fingers; the stalk rises little more than a foot high; the leaves are composed of three or four oval lobes, of a pale colour on their upper side, and hoary underneath; the stalk is terminated by a single flower, which is of a bright red colour, smaller than the above, and of an agreeable sweet scent.

Method of Culture.—The single sorts are easily raised by seeds, and the double by parting the roots.

The seed should be sown in autumn, soon after it is perfectly ripened, or very early in the spring (but the former is the better season), on a bed or border in the open ground, where the soil is rather light, raking it in lightly. It may also be sown in small drills.

The plants should afterwards be properly thinned, kept perfectly free from weeds, and be occasionally watered when the weather is hot and dry.

As they should remain two seasons in the bed, it is necessary, in the second autumn, to spread some light mould over them, to the depth of an inch; and in the autumn following they may be removed where they are to remain. Plants of the double-flowered kinds are often produced from these.

The roots of the old double-flowered plants may be taken up in the beginning of the autumn, and divided so as to have one bud or eye, or more, to each part or crown, as without care in this respect, they never form good plants. And where regard is had to the flowering, they should not be too much divided, or the offsets made too small, as when that is the case they do not flower strong. But where a great increase is wanted, they may be divided more, being left longer in the nursery-beds.

They should be planted out as soon as possible after they are separated, though, when necessary, they may be kept some time out of the earth. The large offsets may be set out at once where they are to remain; but the small ones are best set in nursery-beds for a year, or till of proper strength for planting out.

The plants may afterwards be suffered to remain several years unremoved, till the roots are increased to very large branches, and then be taken up when the stalks decay, in autumn,

autumn, divided, and replanted in their allotted places in the manner directed above.

All the sorts are hardy plants, that are capable of flourishing in any common soil in almost any situation, either in open exposures, or under the shade of trees.

The Portugal variety, however, should have a warmer situation and lighter soil than the others.

They are proper ornamental flowery plants for large borders, and may be had at all the public nurseries. In planting, one should be put here and there in different parts, placing them with the crowns of the roots a little within the surface of the earth, and at a yard at least distant from other plants, as they extend themselves widely every way, assuming a large bushy growth; and, together with their conspicuous large flowers, exhibit a fine appearance, and are often planted at the terminating corners of large borders adjoining principal walls, displaying a bushy growth in their foliage and flowers. When the flowers are gone, the capsules opening lengthways discover their coloured seeds very ornamentally, especially in that called the male pæony and varieties. And to forward this, the capsules may be slit open on the inside at the proper valve; whereby they will expand much sooner, and display their beautiful red seed more conspicuously than would otherwise be the case.

PÆONITES, in *Natural History*, a name given by some writers to the stone called by others *paenites*, and esteemed of great use to women in labour. It seems to have been called pæonites, from Pæonia, in Macedonia, where it was found.

PAES, in *Geography*, a river of Lapland, which runs into the North sea, N. lat. 70°.

PAESIELLO, GIOVANNI, in *Biography*, a Neapolitan, and gifted with as much fertility of invention for dramatic compositions as nature ever bestowed on an Italian opera composer. He was thought, at the beginning of his career, not to have laboured sufficiently at the drier parts of counterpoint, upon which many great masters of Italy have established their fame.

From his early youth he gave way to the fire of his invention, which art could hardly restrain, much less confine to rule. His wildness, however, was never grotesque, ungraceful, crude, wild, or offensive to cultivated ears; but consisted of the most happy flights of fancy, pleasing melodies, and new effects of accompaniment. He at first worked at little dramas in the Neapolitan jargon, so different from good Italian, that it is totally unintelligible to the rest of Italy. This language, however, is allowed to be very poetical, and capable of receiving all the grace and refinements of melody.

He composed for the burletta a comic opera in Italian, as early as 1765, "Amore in Ballo;" and in 1766, "Le Nozze Turbate." In 1770 we heard at Naples his comic opera called "Le Trame per Amore," in which, though the singing was but indifferent, and out of nine characters there was not one good voice, yet the music pleased us extremely. The symphony, consisting of only one movement, was truly comic, and contained a perpetual succession of pleasing passages. The airs were full of fire and fancy, the ritornels abounding with new passages, and the vocal parts in elegant and simple melody, such as might be remembered and carried away after the first hearing, or be performed in private by a small band, or even without any other instrument than a harpsichord or pianoforte. The airs of this drama were much applauded when we heard it performed, though it was the fourteenth night of its run.

But since that time he has continued improving in his style, both in serious and comic operas, and the public all over Europe has not been insensible to his transcendent

merit, as he has justly been regarded at the head of vocal composition of the present time, as Haydn of instrumental. In 1770 he was the only composer in Naples who could make head against the high favour in which Piccini then stood, after his "Buona Figliuola." We were so happy as to hear him *improvise* in music at Sir William Hamilton's, where, having dined, he was begged to sing a scene of an opera; but there being none at hand which he liked to perform, he said "date mi un libretto," and the words of the first opera which could be found having been put on the harpsichord desk, he composed and sung extempore three or four scenes in so exquisite a manner to his own ingenious accompaniment, that no studied music and singing we ever heard of the greatest composers or performers ever pleased us so much. It was not written music, it was inspiration.

He passed three years at Petersburg in the service of the empress Catharine II., whose court was constantly in possession of the best composers and vocal performers of Italy, and there he established a great reputation, which since his return has been constantly increasing in his own country. He is now (1804) at Paris, and though a modern, is as much revered and respected as any of the most invaluable antiques among the spoils of Italy. A list of his works would astonish by the number, as much as they have delighted by their performance, every judge of feeling, who is able to discriminate good music from bad, or perfection from mediocrity.

PAEZ, PEDRO, a man deservedly celebrated in the history of the Jesuits, and of Abyssinia, was a Castilian, born at Toledo of a noble family. Having completed his studies in the company, he was sent to India in the year 1588. The Portuguese in Abyssinia were at this time without a patriarch, or any spiritual assistant, so difficult was it to introduce them into that kingdom, every entrance into which was in possession of the Turks or Moors. To this mission Pæz and P. Antonio de Montserrat were appointed. They were made prisoners on their way, and sent to the court of the king of Xael, by whom they were kindly treated; but being himself tributary to the pacha of Yemen, and bound by treaty to send him all the Portuguese who might fall into his hands, they were sent to Canaan, the capital where the pacha resided. At first their captivity was easy; but afterwards they were treated with great barbarity, in hopes that he might obtain a very large ransom for their liberty. At length the viceroy of India obtained their deliverance, upon the payment of a thousand crowns: they returned to India, where Montserrat soon afterwards died. Pæz was more successful in his second attempt; he entered Abyssinia very safely in 1603, and instead of busying himself with court intrigues, and seeking court favour, he remained quietly among his flock, translating into Abyssinian a compendium of the Christian doctrine, which had been written by Marcus George. He instructed some children in the dialogues of this work. The king of the country, hearing of their proficiency, sent for the master and his scholars to exhibit before him. He was delighted with their performance, and became himself a thorough convert to the Roman Catholic faith; but the zeal which he shewed in behalf of the new system of faith led to his deposition and untimely death. Other revolutions followed; when things, however, were become quiet, Pæz undertook to build a palace at Gorgora, a rocky peninsula, on the south side of the lake of Dembea. He was himself architect, mason, smith, and carpenter, and produced a building which was the astonishment of those who beheld it. A spring-lock, which he fixed upon one of the doors, saved the king's life, when an attempt was made to assassinate him. The last triumph which Pæz enjoyed was that

that of seeing the king put away all his wives but one, and receiving his general confession. He died in May 1622. Gen. Biog.

PAGÆ, in *Ancient Geography*, a town of the territory of Megara, situated towards the north, on a small gulf formed by an extension of the gulf of Corinth, and called "Mare Aleyonium."

PAGAHM, in *Geography*, once a magnificent city of the Birman empire, on the Irawaddy, but now its remains are merely numerous mouldering temples, and the vestiges of an old brick fort, the ramparts of which are still to be traced. The town of Neoundah, about four miles to the north, which may be called a continuation of Pagahm, has flourished in proportion as the latter has decayed. Pagahm is said to have been the residence of forty-five successive monarchs, and was abandoned 500 years ago, in consequence, as it is said, of a divine admonition; but whatever may be its true history it was certainly once a place of no ordinary splendour. The temple of Pagahm rises upwards with a heavy breadth almost to the top, and then terminates abruptly in a point, which give to the buildings a clumsy appearance. Many of the most ancient temples at this place are not solid at the bottom; a well arched dome supports a ponderous superb structure; within, an image of Gaudma sits enshrined; four Gothic door-ways open into the dome, in one of which was a human figure standing erect, said to have been Gaudma, and another of the same personage, lying on his right side asleep, both of gigantic structure. These, however, are not the usual attitudes of the divinity; as he is generally depicted sitting cross-legged on a pedestal, adorned with representations of the leaf of the sacred lotus carved upon the base; the left hand of the image rests upon his lap, and the right is pendent. Beyond the suburbs there is a part where the inhabitants are employed in expressing oil from the Sesamum seed: the grain is put into a deep wooden trough, in which it is pressed by an upright timber fixed in a frame; the force is increased by a long lever, on the extremity of which a man sits and guides a bullock that moves in a circle, thus turning and pressing the seed at the same time; the machine was simple, and effectually answered the purpose. Of these mills, there were not less than 200 within a very narrow compass. From the circumstance of the cattle being in good order, it was concluded that they were fed on the seed after the oil was extracted. The land about Pagahm scarcely yields sufficient vegetation to nourish goats. Symes' Embassy to Ava, vol. ii.

PAGALOAN, a town in the N.W. coast of Mindanao.

PAGAMEA, in *Botany*, Aubl. Guian. v. 1. 112. t. 44. Juss. 209. Lamarck Illustr. t. 88. A genus consisting of only one species, whose fruit was judged by Jussieu to be not sufficiently ascertained. It appears next akin to FARAMEA of the same authors, (see that article,) and likewise belongs to the *Rubiaceæ* of Jussieu. Aublet describes the berry as of two cells, with two seeds, convex on one side, flat on the other, one of them frequently abortive. Each of these seeds, when cut across, is found to have two cells, with a kernel in each cell.—The *Pagamea guianensis* is a shrub seven or eight feet high, growing on the top of the Serpent mountain, in Guiana, and bearing flowers, as well as fruit, in August. The branches spread every way, and are knotty, leafy at the extremities. Leaves opposite, in pairs crossing each other, stalked, lanceolate, pointed, entire, about three inches long, single-ribbed and veiny, smooth and pliant. Stipules sheathing, short, with two small points. Flowers in short, loose, axillary, stalked spikes. Corolla white, funnel-shaped, equally four-cleft, downy within.—No reason is given

for the name, nor any thing said about the qualities or uses of the plant, except that the wood is hard, and of a yellowish colour.—The trunk is only five inches in diameter.

PAGAN, PAGANUS, a heathen, gentile, or idolater, one who adores false gods.

Baronius derives the word *paganus*, a *pagis*, *villages*, because, when Christians became masters of the cities, the heathens were obliged, by the edicts of Constantine and his sons, to go and live in the country villages, &c. Salmastius will have the word come from *pagus*, considered as originally signifying *gens*, or *nation*: whence he observes, we say indifferently, pagans, or gentiles.

The abbot de Fleury gives another origin of pagan: he observes, that the emperor Constantine, going from Antioch, against Maxentius, in 350, assembled all his troops, and advised such as had not received baptism to receive it immediately; declaring withal, that such as should be found unbaptized should quit the service, and go home.

Hence, perhaps, says the abbot, the name pagan might be given to those who chose the latter; the Latin word *paganus* properly signifying a *person who does not bear arms*, in opposition to *miles*, a *soldier*.

And hence it might, in time, extend to all heathens; or, continues he, the word might come from *pagus*, *village*, in regard the peasants were those who adhered longest to the idolatry of the heathens.

PAGAN, BLAISE FRANÇOIS, *Compte de*, in *Biography*, an eminent military engineer, was born at Avignon in the year 1604. He entered into the army at twelve years of age, and distinguished himself in a variety of actions. He was patronized by his near relation, the constable de Luynes, whom he had the misfortune to lose at the siege of Montauban, at which he was also deprived of the sight of an eye by a musket-shot. At the passage of the Alps, and the barricades of Suza, he placed himself at the head of a determined band, and having gained the summit of a steep mountain, he cried out "This is the road to glory," and instantly slid down the mountain; and being imitated by his men, they arrived first at the barricades and carried them. When the king, Lewis XIII., laid siege to Nanci in 1633, Pagan had the honour to attend him in drawing the lines and forts of circumvallation. In 1642 he was sent to the service of Portugal, in the post of field-marshal, and there he had the misfortune to lose his eye. Though disabled from serving his country in the active duties of a warrior, he was intent upon augmenting its glory, by extending the boundaries of military science. Having from his youth closely applied to mathematical studies, with a particular view to the science of fortification, he now employed the whole force of his active mind in speculations of this kind, and in 1645 published his "Traité des Fortifications;" this was regarded as the best work that had ever been written on the subject, and it is said that whatever improvements have been made since, have been derived chiefly from this treatise, as conclusions from its principles. In 1651 he published his "Theoremes Geometriques," which shew an extensive and deep knowledge of all the parts of the mathematics. In 1655 he published an "Historical and Geographical Account of the River Amazons, extracted from different Writers," and we are assured, that though blind, he drew the chart of that river and the parts adjacent. His other works, published in 1657 and 1658, were "Theorie des Planetes;" and "Tables Astronomiques;" by the former he cleared the system from that multiplicity of eccentric circles and epicycles, which astronomers had invented to explain their motions. His astronomical tables are reckoned succinct, and very plain. Pagan died at Paris, November 18, 1685. He was devoted

to judicial astrology; but what he wrote on this subject is the only thing which detracts from his high character. He had an universal genius, and having applied himself entirely to the art of war, and particularly to the branch of fortification, he made much progress in it. He understood the deeper branches of the mathematics, and had so fine a genius for these abstruse speculations, that he read but little on the subject, his own fertile mind supplying him with almost every thing that he wanted. Lewis XIII. regarded him as one of the most adroit, and most valiant men in his kingdom. That branch of his family which removed from Naples to France in 1552, became extinct at his decease. All his works were collected and printed in 12mo. in the year 1669. Moreri.

PAGAN, PETER, a distinguished poet of the 16th century, was born at Wanfrid, in Hesse, and being educated with great care, he exhibited at an early age much literary taste, and a particular turn for poetry. In the year 1550 he received the degree of bachelor in philosophy, and he became poet to the emperor Ferdinand. To the study of poetry he joined that of history, and was elected professor of both in the university of Marburg. He died at Wanfrid, on the 29th of May, 1576. Besides many pieces in poetry on miscellaneous subjects, he left "Historia tergemorum Romanorum et Albanorum fratrum," in verse, which contained the history of the three Horatii, and the three Curatii. Moreri.

PAGAN Creek, in *Geography*, a river of Virginia, which runs into James river, N. lat. 37° 5'. W. long. 76° 37'.

PAGANALIA, an ancient rural feast thus called, because celebrated in the villages, *in pagis*.

In the paganalia, the peasants went in solemn procession all round the village, making lustrations to purify it. They had also their sacrifices, wherein they offered cakes on the altars of the gods.

Halicarnassus and St. Jerom refer the institution of the paganalia to Servius Tullus. They were held in the month of February.

PAGANELLUS, in *Ichthyology*, a species of *Gobius*; which see.

PAGANICA, in *Geography*, a town of Naples, in Abruzzo Ultra; 8 miles N.N.W. of Aquila.

PAGANINA, an Italian word, used by some authors to express the first excrements of children: these, dried and reduced to powder, are esteemed by some a very great and powerful medicine against epilepsies. It is to be taken in small doses, every day, for some time.

PAGANINI, LA, in *Biography*, an admirable singer and actress in the character of *prima buffa* in the burletta operas of "Il Mondo della Luna," and "Il Filosofo di Campagna," composed by Galuppi, when his genius was in full fire. The airs "Si l'Uomini sirpirano," and "Donne, donne, fiamo Nate," were sung in a way so piquant and agreeable by the Paganini, that the applause which she acquired by them amounted almost to acclamation. This last opera had an uninterrupted run of fifteen nights; and the Paganini, though not young when she came hither from Berlin, in 1760, increased in reputation so much during the run of this opera, that when it was her turn to have a benefit, such a crowd assembled as we never remember to have seen on a like occasion, before or since; indeed, not one-third of the company that presented themselves at the opera-house doors were able to obtain admission. Caps were lost, and gowns torn to pieces, without number or mercy, in the struggle to get in. Ladies in full dress, who had sent away their servants and carriages, were obliged to appear in the streets and walk home in great numbers without caps or

attendants. Luckily the weather was fine, and did not add to their distress by rain or wind; though their confusion was greatly augmented by its being broad daylight, and the streets full of spectators, who could neither refrain from looking or laughing at such splendid and uncommon street-walkers.

PAGANISM, the religious worship and discipline of pagans; or the adoration of idols and false gods.

The gods of paganism were either men, as Jupiter, Hercules, Bacchus, &c. or fictitious persons, as Victory, Fame, Fever, &c. or beasts, as in Egypt, crocodiles, cats, &c. or finally inanimate things, as onions, fire, and water, &c.

PAGAPATE, in *Botany*, Sonnerat Guian. 16. t. 10, 11. See SONNERATIA.

PAGARCHUS, *παρχος*, formed from *pagus*, *village*, and *αρχη*, *command*, among the ancients, a petty magistrate of a pagus, or little district, in the country.

PAGASA, or PAGASU, in *Ancient Geography*, a town of Magnesia, formerly a part of the town of Phœræ.

PAGE, formed from *παῖς*, *child*, *boy*, a youth of state, retained in the family of a prince, or great personage, as an honourable servant to attend in visits of ceremony, carry messages, bear up trains, robes, &c. and at the same time to have a genteel education, and learn his exercises.

The pages in the king's household are various, and have various provinces assigned them: as pages of honour, pages of the presence-chamber, pages of the back stairs, &c.

Pages were anciently distinguished from the other servants in livery, by their wearing drawers in lieu of breeches; and sleeves turned up with velvet.

Cujas and Gothofred observe, that pages in the emperor's families were called *pagagogiani pueri*. Fauchet says, the word page was first given to the little boys who attend tilers, to bring them their tiles, &c. that till the time of Charles IV. or VII. the name was common to the basest servants; and it is since then, that page is become a term of honour; and the meaner servants are distinguished from them by the name of lacqueys, valets, &c.

PAGE is particularly used in the Turkish seraglio, for the children of tribute, or slaves who wait on the grand signior.

They are commanded by the first aga, and constitute four classes, called odas.

PAGE of a Book. See PRINTING.

PAGEANS, in *Mythology*. See PYGMIES.

PAGEANT, a triumphal car, chariot, arch, or other the like pompous decoration, variously adorned with colours, flags, &c. carried about in public shows, processions, &c.

PAGEL, in *Ichthyology*, a name given by the Spaniards to that fish which authors in general called the *erythrinus*, or *rubellio*, and some the *xathus* and *pagrus*. It is properly a species of the *sparus*, and is distinguished by Artedi from the rest of that genus, by the name of the *silver-eyed red-bodied SPARUS*, which see.

PAGET'S PORT, in *Geography*, a small harbour within the great found in Bahama islands, and in the most easterly part of the found.

PAGHATAKAN, a town of New Jersey, on the Pa-pachton. N. lat. 42° 8'. W. long. 74° 40'.

PAGI, ANTHONY, in *Biography*, a celebrated Cordelier, and one of the ablest critics of his time, was born at Rogne, in Provence, in the year 1624. He embraced the monastic life, in the convent of Arles, in the year 1641, and obtained so high a reputation, that he became four times provincial of his order; but his religious duties did not prevent his application to the study of chronology and ecclesiastical history, in which he excelled. His most considerable work is a critique

critique upon the "Annales" of Baronius, in which, following the learned author year by year, he has rectified an infinite number of mistakes, both in chronology, and in the representation of facts. The first volume was published at Paris in 1689, and dedicated to the clergy of France, who allowed him a pension; the other three were not printed till after the death of the author: the publication of them was superintended by his nephew Francis. A new edition of the whole was published at Geneva in the year 1727. Father Pagi died at Aix in 1699. His nephew, already referred to, having finished the publication of his uncle, employed himself in writing a work of his own, which he published under the title of "Breviarium Historico-Chronologico-Criticum, Illustriora Pontificum Romanorum Gestæ, Conciliorum Generalium Acta, &c. complectens," forming in the whole four volumes, 4to. This work is said to display much curious research, and is drawn up in a correct and neat style. Francis Pagi died in 1721, in the sixty-seventh year of his age. He left a nephew, Anthony, on whom devolved the care of publishing the last volume of his uncle's "Breviarium." Moreri.

PAGIETTA, in *Geography*, a town of Naples, in Abruzzo Citra; 5 miles S. Langiano.

PAGIN, M., in *Biography*, a violinist at Paris in the year 1770, much admired for his taste, neatness, and delicacy, by judges of the violin,—not of the French school. He was a disciple of Tartini, and regarded by many at Paris as his best scholar. Having had the honour of being hissed at the Concert Spirituel for daring to play in the Italian style, he quitted music as a profession, and had a place conferred upon him under the count de Clermont, of about 250*l.* a-year.

PAGLIA, in *Geography*, a river of Italy, which runs into the Tiber, a few miles below Orvieto.

PAGLIANELLO, a town of Naples, in Lavora; 14 miles N.E. of Capua.

PAGLIANO, a town of Naples, in Abruzzo Ultra; 15 miles E.S.E. of Aquila.

PAGLIAPOLI, a town of Naples, in Calabria Ultra; 4 miles E. of Gierace.

PAGLION, a river of France, which runs into the Mediterranean, a little to the E. of Nice.

PAGNINUS, SANCTES, in *Biography*, an Italian Dominican monk in the fifteenth century, eminent for his skill in the oriental languages and biblical learning, was born at Lucca in 1466, but according to others, in the year 1470. At the age of sixteen he took the habit in a convent of the Dominican order, and applied with extraordinary diligence to the study of the learned languages, and of divinity. He became deeply and accurately skilled in Latin, Greek, Hebrew, Chaldee, and Arabic, but he was particularly celebrated for his knowledge of the Hebrew language. He spent the greater part of his life in a monastery at Lyons, was distinguished by his zeal in defending the Catholic church against the attacks of the reformers, and laboured to prevent the numerous Italian families which had settled in this city from being converted by the emissaries of the Waldenses and Lutherans. Pagninus is, however, chiefly known by his making the first modern translation into Latin of the Old Testament from the original Hebrew, and of the New Testament from the Greek. To this design he was led from a firm conviction that the Vulgate translation, as it has descended to modern times, is greatly corrupted from the state in which it was left by St. Jerome. It was his object, therefore, to produce a new translation, in which the Vulgate should be followed whenever fidelity to the originals permitted. Being patronized by Leo X. he began his great work in 1493, and having employed himself in it with the greatest

affiduity twenty-five years, finished it in 1518. He then applied to the translation of the apocryphal books and the New Testament, both of which he rendered from the original Greek before the year 1521. The whole was published at Lyons in 1528, under the title of "Veteris et Novi Testamenti nova Translatio, per Sanctum Pagninum nuper edita, approbante Clemente VII." Many high commendations have been bestowed upon this work by the most learned rabbis, who have given it the preference to all other translations of the sacred Hebrew writings, and likewise by many eminent Christian critics, Catholic and Protestant, and among others, by Leusden, Erpenius, Buxtorf, and Huet. But father Simon and others, though they admit that Pagninus has shewn great learning and talents, contest its claims to the superior excellence which the former attribute to it. Simon says it is obscure, barbarous, and full of solecisms, and he maintains that it sometimes changes the sense of the text. The version has gone through many editions. Huet, though he gives Simon credit for the general truth of his criticisms, yet proposes his manner as a model for all translators of the sacred books; "Scripturæ interpretandæ rationis utile nobis exemplar proposuit Sanctus Pagninus." This author published "Thesaurus Lingux Sanctæ," in folio, which was reprinted by Robert Stephens, under the title of "Thesaurus Lingux Sanctæ contractior et emendatior." Pagninus published many other works; he died at Lyons in 1536. Buxtorf, who made much use of his Thesaurus, in forming one of his own, calls him "Vir linguarum Orientalium peritissimus." Luther spoke of him with great applause.

PAGO, in *Geography*, an island in the Adriatic, near the coast of Dalmatia, or Morlachia, about 20 miles long and 6 broad containing several villages. It is subject to a stormy sea, so that neither wood, nor pasture, nor corn lands are found upon that part which is opposite to the continent, except in few places. The air is darkened by the salt mist that is raised by the collision of the waves in the narrow channel of Morlachia. The large lake itself is not calm in the stormy season, and so far from being a harbour, it is tempestuous and useless. The inhabitants of the city are not secure in their houses, without defending the roofs by large stones, nor can they leave them with safety during the violence of the wind. This island in winter is no less inhospitable than Siberia, always covered with snow and fire, and exposed to the cold north wind. The nakedness of the rocks, which form the surface of almost the whole island, the narrowness of the vallies, the reverberation of the water of the lake, which is generally quite calm in summer, increase the heat to such a degree among the stones, that the vines which are planted round the lake ripen the grapes before the beginning of August, and the few other productions of the spot anticipate the usual time of maturity. The part of the island under the jurisdiction of Pago, produces about 40,000 barrels of good wine, and about 2000 of Rakia, one year with another. The island is covered with sage and odoriferous herbs; which furnish food for the bees, inasmuch that honey forms no inconsiderable branch of trade. The pasture among barren rocks maintains also a large number of sheep and goats, so that the wool, which is very bad, and cheese, furnish small articles of export. The northern part of the island, called "Novaglia," and depending on the government of Arba, is well supplied with water, and has good pastures on its low grounds, by which its black cattle are larger and better than those on any of the neighbouring islands, or of litoral Dalmatia. The produce of corn and oil is very scanty, and not sufficient for two months sustenance of the inhabitants. The most considerable produce

duct of the island is salt : the salt-works belonging partly to the government, and partly to private proprietors. The northern extreme of the island, called "Punta di Loni," is abundantly supplied with wood for various purposes, though other parts are wholly destitute. The roots and trunks of old olive trees afford excellent materials for the cabinet-makers and sculptors. The soil of the island, that is, of the land lying on the declivity and at the bottom of the hills, is very gravelly and light; but on the northern extremity, where are plains, though stony, the land is better and stronger, and might be cultivated for all sorts of corn. The whole number of inhabitants amounts only to 3500, most of whom live in the city of Pago, which is supposed to contain 3000. N. lat. 44° 40'. E. long. 15° 10'.

PAGO, a town of the above island, built by the Venetians in the year 1468. This city has undergone various revolutions. The difficulty of access to it, and the bad accommodation it affords to strangers, render the intercourse with it very unfequent; and to this circumstance it is owing that the inhabitants are as wild and unpolished, as if they were ever so remote from the sea, and the commerce of polite people. Even the gentry exhibit grotesque figures, both in their drefs and behaviour; and the ignorance of the clergy is incredible.

PAGOD, or PAGODA, a name which the Portuguese have given to all the temples of the Indians, and all the idolaters of the East.

These pagods, or pagodas, are mostly square; they are stone buildings, which are not very lofty, and are crowned with a cupola. Within, they are very dark; for they have no windows, and only receive their light through the entrance. The image of the idol stands in the deepest and darkest recess of the temple; it is of a monstrous shape, and of uncouth dimensions, having many arms and hands. Some of these idols have eight, and others sixteen arms; with a human body, and the head of a dog, with drawn bows and instruments of war in their hands. Some of them are black, others of a yellowish hue. In some pagodas there are no images, but only a single black, polished stone, lying upon a round altar, covered with flowers and sandal-wood, which were strewed upon it. Greater veneration is manifested for these stones than for the idols themselves. Their worship of these divinities consists in throwing themselves upon the ground, and making their salam, or salutation, with their hands, and ejaculating their prayers in silence, in that posture. The offerings which they are accustomed to present to their gods consist of flowers, rice, pieces of silk and cotton, and sometimes gold and silver. Every thing is laid before the idols, and is taken care of by the Brahmins, who profit the most by it. They guard the pagodas both by day and night. The pagodas of China are lofty towers, which sometimes rise to the height of nine stories, of more than 20 feet each.

In order to give such an idea of these buildings as may enable the reader to judge with respect to the early state of arts in India, we shall briefly describe two, of which we have the most accurate accounts. The entry to the pagoda of Chillambrum near Porto Novo, on the Coromandel coast, held in high veneration on account of its antiquity, is by a stately gate under a pyramid, 122 feet in height, built with large stones above forty feet long, and more than five feet square, and all covered with plates of copper, adorned with an immense variety of figures, neatly executed. The whole structure extends 1332 feet in one direction, and 936 in another. Some of the ornamental parts are finished with an elegance entitled to the admiration of the most ingenious artists. The pagoda of Seringham, superior

in sanctity to that of Chillambrum, surpasses it as much in grandeur; and, fortunately, we can convey a more perfect idea of it by adopting the words of an elegant and accurate historian. This pagoda is situated about a mile from the western extremity of the island of Seringham, formed by the division of the great river Caveri into two channels. "It is composed of seven square inclosures, one within the other, the walls of which are twenty-five feet high, and four thick. These inclosures are 350 feet distant from one another, and each has four large gates with a high tower; which are placed, one in the middle of each side of the inclosure, and opposite to the four cardinal points. The outward wall is near four miles in circumference, and its gateway to the south is ornamented with pillars, several of which are single stones, thirty-three feet long, and nearly five in diameter; and those which form the roof are still larger; in the inmost inclosures are the chapels. About half a mile to the east of Seringham and nearer to the Caveri than the Coleroon, is another large pagoda, called Jembikisima; but this has only one inclosure. The extreme veneration in which Seringham is held, arises from a belief that it contains that identical image of the god Wischnu, which used to be worshipped by the god Brahma. Pilgrims from all parts of the peninsula come here to obtain absolution, and none come without an offering of money; and a large part of the revenue of the island is allotted for the maintenance of the Brahmins who inhabit the pagoda; and these, with their families, formerly composed a multitude not less than 40,000 souls, maintained, without labour, by the liberality of superstition. Here, as in all the other great pagodas of India, the Brahmins live in a subordination which knows no resistance, and slumber in a voluptuousness which knows no wants."

The pagods of the Chinese and Siamese are exceedingly magnificent.

The revenues of the pagod of Jamigrade are so great, as to furnish, every day, from fifteen to twenty thousand pilgrims.

PAGOD is also used for the idol adored in the temple.

Hence, many give the name pagod to those little porcelain images brought from China.

PAGOD, or *Pagoda*, is also the name of a gold coin, current in several parts of the Indies, on the footing of the piece of eight.

There are also silver pagods, struck at Narsingua, Bisnagur, &c. which usually bear the figure of some monstrous idol: whence their names. They are of various values.

Accounts are kept at Madras, or Fort St. George, on the Coromandel coast, in pagodas, fanams, and cash; 80 cash = 1 fanam, and 42 fanams = 1 pagoda. Such is the mode of reckoning used by the East India company, and other European merchants, but among the natives, the value of the pagoda varies from 44 to 46 fanams. The gold coins are star or current pagodas; and the silver coins, Arcot rupees. Double and single fanams are current here, and copper pieces of 20 cash, called pice. Also pieces of five and ten cash, called doodee, and single cash pieces: these copper coins are struck in England, bearing the date of 1803, and the value is marked upon each. The star pagoda weighs 52.56 English grains, and the gold is 19½ carats fine; it therefore contains 42.048 grams of fine gold, and is worth 7s. 5¼d. sterling; but it is commonly valued at 8s. In the company's books, 100 star pagodas are valued at 425 current rupees; and 10 star pagodas at 16 Spanish dollars. Many other coins circulate on the Coromandel coast, of which the most generally current are the following; viz. the old pagoda, with three swamy, or figures, coined at Madras and Negapatam, which is about 20¾ carats fine, and which generally

nerally bears a batta, *i. e.* an agio or discount of 10 *per cent.* against the new coins of the same places: the old pagoda of Negapatam and Tutocoryn, which is of the same value as the star pagoda: the new pagoda of Negapatam and Tutocoryn, which is 18½ carats fine; and is reckoned about 4 *per cent.* worse than the star pagoda: the Porto Nova pagoda, which is 17½ carats fine; and is about 20 *per cent.* worse than the star pagodas: the Pondicherry pagoda, originally equal in value to the star pagoda, but its standard has been lowered to 17 carats, and even less. All these different pagodas are nearly of the same weight. Mohurs, or gold rupees of Bengal, occasionally pass here for four star pagodas. There are also gold fanams, which are only 7½ carats fine, and are alloyed chiefly with silver; 24 of these are reckoned for an old Negapatam pagoda.

Gold and silver are weighed by the current or star pagoda weight, as above stated. At Mangalore, on the Malabar coast, accounts are kept in Sultanee pagodas, rupees, and annas; the pagoda being four rupees, and the rupee, 16 annas: others divide the pagoda into 10 hunas, and the huna into 16 parts, called likewise annas. At Masulipatam, on the Coromandel coast, accounts are kept in pagodas, rupees, and annas; the pagoda being 3½ silver rupees, and the rupee 16 annas. The coins, besides gold and silver rupees, are pagodas of nearly the value of the star pagoda of Madras.

In the Myfore country, and particularly at the capital, Seringapatam, accounts are kept in Canter'raia pagodas, and palams, called by the English Canter'raia pagodas and fanams. This pagoda is an imaginary money, and the fanam, which is a real coin, is the 10th part of the pagoda. The coins are gold mohurs, which pass for four pagodas; sultany pagodas, coined by Tippoo Sultan, and other pagodas, coined by Hyder Ally, and by the rajah of Myfore, all passing for 13 fanams: also, sultany rupees, and rajah rupees, 26 of which pass for 7 sultany pagodas; copper dudus, called by the English dubs, 260 of which are the market price for a sultany pagoda. The shroffs, when they exchange copper for gold or silver, pay at the rate of 234 dudus for a pagoda; but when they change gold and silver for copper, they receive 240; whilst the price fixed by government is 182 dudus *per pagoda*: and the other coins exchange in proportion. At Pondicherry, the coins are gold pagodas, and silver rupees and fanams. Gold and silver are weighed by the star pagoda, rupee, and fanam. A pagoda weighs 9 fanams, or 144 nellos; so that three rupees are equal in weight to 10 pagodas; 71½ pagodas weigh a French mark, or 3778 English grains.

The following table shews the assay, &c. of the several pagodas which it specifies, W. every where denoting worse than English standard, and the mint price of gold in England, that is 3*l.* 17*s.* 10½*d.* *per ounce*, being standard.

	Assay.	Weight.	Contents in pure Gold.	Value in Sterling.
	car. gr.	oz. dwt. gr.	grains.	£. s. d.
* Star pagoda - - - - -	W. 3 0	0 2 4¾	42.	0 7 5¼
Old Arcot ditto - - - - -	W. 3 2	0 2 4½	40.5	0 7 2
New Arcot ditto - - - - -	W. 7 1	0 2 4½	32.4	0 5 8¾
Onore ditto - - - - -	W. 1 3¼	0 2 4½	44.2	0 7 10¾
Mangalore ditto - - - - -	W. 1 2½	0 2 4½	44.6	0 7 10¾
Pagoda, with a crescent and } three figures - - - - -	W. 1 3¼	0 2 5¼	44.7	0 7 11
Pagoda, with a crescent and } one figure - - - - -	W. 2 1¾	0 2 4	42.4	0 7 6
Pagoda of Pondicherry - - - - -	W. 5 0	0 2 4½	36.2	0 6 5
Hyderee Hoon, or pagoda - - - - -	W. 2 1¼	0 2 4¾	43.3	0 7 8
Sultanee Hoon, or pagoda - - - - -	W. 0 3¼	0 2 4¾	47.5	0 8 5

* N. B. The fineness of the star pagodas varies from W. 2 car. 3 gr. to W. 3 car. 0½ gr.

The pagodas differ in shape from all European coins: they have a convex side, with prominent dots, and a flat side which generally bears a figure, and in some three figures, of Indian idols. The star pagoda is marked on the convex side with a star; other pagodas are marked with a crescent, or with an initial letter; the pagodas of Masulipatam and Pondicherry have nothing on the convex side but the dots. Tippoo's pagodas have no figure on the flat side, but a legend which is translated thus: "Mahomet, he is the authority of equity," with the date of the Hegira: on the convex side, the name of the place where it was coined, and generally the initial of Hyder. Kelly's Universal Cambiit.

PAGODA Bay, in *Geography*, a bay on the East coast of Cochinchina. N. lat. 12° 21'. E. long. 109° 4'.

PAGON, or ST. IGNATIUS, one of the Ladrone islands, about 36 miles in circumference; 30 miles N. of Amalagan.

PAGOOR, a town of Bootan; 16 miles S. of Tassafudon.

PAGOUA BAY, a bay on the east coast of the island of Dominica. N. lat. 15° 18'. W. long. 61° 19'.

PAGOYUM, a word used by Paracelsus and his followers, to express an imaginary being, which presides over, or is the occasion of diseases, whose causes are less known, and which have been supposed to arise from enchantment. Such is the doctrine of this strange writer, and on this subject he has written a treatise called *Pagoyus*.

PAGRUS, in *Ichthyology*, a species of *Sparus*; which see. See also SPARUS *Dentex*, and SPARUS *Erythrinus*.

PAGUL, in *Geography*, a town of Africa, in Whidah; six miles N.W. of Sabi.

PAHA-CACHON, a town of Thibet; 100 miles S.W. of Hara-Toubé.

PAHANG, PAHAN, or *Pán*, a sea-port town on the E. coast of Malacca, called by the Portuguese "Paon," and by the Arabs "Fân." It is situated about four leagues from the sea, and inhabited only by nobility, the people dwelling in the suburbs. It is inclosed by a wall, made of the trunks of trees joined close together, and about 24 feet in height, strengthened with a bastion. The streets are fenced on both sides with hedges of reeds, and planted with cocoa

and other trees; so that Pahang appears more like an assemblage of gardens than a regular town. The houses are constructed of reeds and straw, the king's palace only being of wood: for Pahang was formerly the capital of a kingdom, but it is now part of Johor. The adjacent country is low, but fertile, producing pepper, eagle and calambac woods, coarse gold, nutmegs, Sapan wood, diamonds, and hog-stones, deemed of superior efficacy to bezoar-stones. In the interior of the country elephants are numerous. N. lat. $3^{\circ} 40'$. E. long. $103^{\circ} 36'$.

PAHANG, or *Pulo-Pahang*, a small island near the coast of Malacca; five miles E. from the town of Pahang.

PAHARGUNGE, a town of Bengal; ten miles S.W. of Beyhar.

PAHAVENS, a town of Persia, in the province of Irak; 30 miles W. of Jedd.

PAHICH, a town of Arabia, in the province of Hedjaz; 60 miles S.E. of Medina.

PAHIE is one of the classes of canoes or boats used by the inhabitants of the islands in the South sea. The pahie is of different sizes, from sixty to thirty feet long, but very narrow; a transverse section of it resembles the spade of cards, the whole being much wider in proportion to its length. The largest pahies are used for fighting, in which case they are fitted with a stage or platform; but principally for long voyages. Hawkefworth's *Voy.* vol. ii. p. 222, &c. See *BOAT (Pahie.)*

PAHO, in *Geography*, a river on the W. coast of the isle of Celebes, which runs into the straits of Macassar. S. lat. $3^{\circ} 10'$. E. long. $119^{\circ} 52'$.

PAHVA, a small island on the coast of Finland, with a town upon it. N. lat. $60^{\circ} 29'$. E. long. $21^{\circ} 30'$.

PAHVITTRAM, a town of Hindoostan, in the Carnatic; 14 miles E.S.E. of Coveripurum.

PAJACK, in *Commerce*, a corn measure in Russia: thus, the chetwert or cool of corn is 2 ofmins, 4 pajacks, 8 chetwericks, or 64 garaitzy. A cool of flour is 9 poods, and a sack 5 poods. The chetwerick is $13\frac{1}{2}$ English inches in diameter, and $11\frac{1}{2}$ in depth; it therefore measures 1555,92 cubic inches, and contains $5\frac{1}{2}$ Winchester gallons nearly. In business the usual calculation is, that 100 chetwerts produce 72 quarters, and 1 chetwert $5\frac{3}{4}$ bushels, Winchester measure.

PAJANA, in *Geography*, a lake of Sweden, in the province of Tavaftland, about 100 miles in length.

PAJAS, a town of Asiatic Turkey, in the government of Marasch and bay of Alexandretta; five miles W. of Alexandretta.

PAJAUNNY, a town of Hindoostan, in Oude; 30 miles W. of Kairabad.

PAICHAM, a town of Chinese Tartary. N. lat. $42^{\circ} 42'$. E. long. $120^{\circ} 22'$.

PAIDORFF, a town of the duchy of Stiria; six miles N. of Muehrau.

PAIGLES, in *Botany*. See *PRIMULA*.

PAIJALA, in *Geography*, a town of Sweden, in West Bothnia; 86 miles N. of Tornea.

PAIL, in *Rural Economy*, a wooden vessel in which milk, water, or other fluids are commonly carried.

PAIL-Brush, in *Agriculture*, a sort of hard brush furnished with bristles at the end to clean out the angles of the vessels more fully. These ought to be in every dairy, though in many districts their use is scarcely known.

PAIL-Stake, in *Rural Economy*, a simple contrivance for drying dairy utensils upon, being merely a bough of a tree furnished with different small branches, which is fixed with its

thick end into the ground in the dairy-yard. The several small branches being lopped of proper lengths, the stumps afford pegs for hanging the pails upon, or for other utensils, by which they are not liable to be blown down and thereby burst or injured.

PAILLY, in *Geography*, a town of Hindoostan, in Vi-fiapour; five miles S.S.W. of Sattarah.

PAIMBŒUF, or PAINBŒUF, a town of France, and principal place of a district, in the department of the Lower Loire, situated at the mouth of the Loire, 21 miles W. of Nantes. The place contains 4220, and the canton 6047 inhabitants, on a territory of $72\frac{1}{2}$ kilometres, in three communes. N. lat. $47^{\circ} 17'$. W. long. $1^{\circ} 97'$.

PAIMPOL, a town of France, in the department of the North Coasts, and chief place of a canton, in the district of St. Brienc; seven miles E. of Treguier. The place contains 1679, and the canton 16,319 inhabitants, on a territory of $127\frac{1}{2}$ kilometres, in 11 communes.

PAIN, DOLOR, $\alpha\lambda\gamma\eta$, in *Medicine*, an uneasy and distressing sensation, which is connected with various forms of disease, and with various species of injury, inflicted upon the living body.

As we are altogether unable to explain the nature of sensation, and the agency of the nervous system, as the organ of that faculty; so it is impossible to give any satisfactory account of the proximate cause of pain. As in all similar cases, we must content ourselves with considering it as an ultimate fact, and with observing the various circumstances under which it occurs, and the different phenomena which accompany it. All the attempts which have been made to explain its nature, being founded entirely upon hypothetical speculations that have been altogether gratuitous, are justly exploded.

The varieties of pain can only be described by referring to the common agents by which they are excited, to the parts of the body in which they are seated, or to the degree and duration of their occurrence. The external agents, which produce painful sensations, operate variously upon the living body; some by mechanical, and some by chemical action upon the animal fibre; while others act by a peculiar influence upon the nervous system, without deranging the structure of the sentient parts. The mechanical agents are all such as tend to produce a solution of continuity in the solid parts, to interrupt the circulation of the blood in them, and to produce an extravasation of the fluids from their proper vessels: whence pain is a consequence of blows, bruises, and continued pressure, of laceration from the bites of animals, of abrasion, of the cutting and stabbing of sharp instruments, &c. The chemical agents produce a solution of continuity, by inducing the parts of the living body, like dead matter, to enter into new combinations: whence pain is the consequence of the action of fire, or intense heat from any source, and of a number of acrid substances, which corrode the substance of the body, such as the strong mineral acids, the pure alkalies, &c. Again, the third class of external causes of pain consists of those agents, which act speedily upon the sentient system, injuring its functions, without lesion to any organic structure; namely, the venomous and narcotic secretions of animals and vegetables, which are called poisons. As the operation of these various exciting causes occasions many modifications of pain, which are probably very similar in different individuals, we are thus furnished with a language, by which the various painful sensations may be described to those who feel them not. Thus we speak of a burning, stinging, pricking, gnawing, cutting, or lacerating pain. Pains are also distinguished by other

PAIN.

other concomitant sensations, such as by being connected with a sense of weight, of throbbing or pulsation, of rawness or excoriation, of tension or contraction, of formication or the creeping of insects, of shooting or darting through particular parts, of coldness, of torpor or numbness, and so forth. Some pains, again, are characterized by remaining fixed and immovable; while others are flying or wandering pains, leaving one part and seizing upon others in succession; and others are periodic or intermittent, ceasing altogether for a certain number of days or hours, and recurring with great regularity, like the paroxysms of an ague.

Many of the causes above-mentioned, however, do not immediately excite pain, but indirectly, by producing one of two morbid conditions, which are invariably accompanied by pain; we mean *inflammation*, or *spasm*: whence pain frequently occurs, as a symptom of these diseases, arising from internal causes, and independently of the violent operation of the external agents above enumerated. The diagnosis between these two sources of pain, in many maladies, is of the utmost practical importance, as the indications of cure are nearly of an opposite nature in the two cases.

Before we come to these practical points, it may be proper to notice some pathological facts, which are worthy of observation. It is obvious, that the nervous system is the medium of sensation, or the communicating link between the parts receiving the impression, and the common sensorium, the brain, where the perception is produced. For if the nervous trunks are divided, and the communication cut off, the parts of the body, so insulated, may be cut or otherwise injured without pain, and even without the cognizance of the individual. Hence the pain cannot be said strictly to be seated in the part to which the sensation is referred. This is illustrated in a remarkable manner in case of the loss of limbs by amputation or accident. The patients, in these instances, often complain of pain in the fingers or toes of their lost arm or leg; a sensation, which can only arise from the impression which the wounded nerve makes upon the brain, being similar to that which it had been accustomed to convey from the extremity of its branches, while the limb remained perfect. In other cases, again, the pain is not even referred by the mind to the actual seat of the irritation which induces it, but to some other point, at a distance from it. Thus the part which is the seat of unceasing sensation, when the cells of the lungs are loaded with mucus, blood, or other matters, is the top of the larynx, or wind-pipe, which excites the effort of coughing, to expel the offending substance, and which subsides when the cells are unloaded. In a similar manner, in inflammation of the liver, the pain which is most complained of is not always seated in that organ, but is often referred to a small space at the top of the shoulder. And in all cases of irritation in the urinary bladder, whether from the presence of a stone or gravel in that sac, of acrid urine, of blood, pus, or other foreign matter, the most poignant irritation is often seated at the extremity of the urethra. The facts are not easily explained, but are necessarily referred to some peculiar communication of sympathy through the distribution of the nerves.

It is a curious fact, which has been attempted to be explained in various ways, that pain is much alleviated by certain exertions of the voluntary muscles; whence, in all cases of violent pain, persons are observed to resort to some species of exertion, such as grasping any thing strongly, fixing the teeth, exerting the voice in screams or moaning, &c. Dr. Darwin, with his accustomed acuteness, generalizes this observation to a great length. "The restlessness

in some fevers," he says, "is an almost perpetual exertion of this kind, excited to relieve some disagreeable sensations; the reciprocal opposite exertions of a wounded worm, the alternate emprosthotonos and opisthotonos of some spasmodic diseases; and the intervals of all convulsions, from whatever cause, seem to be owing to this circumstance of the laws of animation; that great or universal exertion cannot exist at the same time with great or universal sensation, though they can exist reciprocally; which is probably resolvable into the more general law, that the whole sensorial power being expended in one mode of exertion, there is none to spare for any other." *Zoonomia*, vol. i. sect. xxxiv. 1, 2.

This idea of the two great powers of motion, sensation and volition, in the animal machine, is, Dr. Darwin thinks, confirmed by the observation, that they never exist in a great degree or universally at the same time; and hence he would account for the fact, stated above, that we instinctively exert our voluntary motions, when suffering severe pain or uneasiness, and thus procure ourselves relief. The ingenuity with which he illustrates the modes of exertion, in cases of bodily suffering, is peculiarly his own.

"When any violent pain afflicts us, of which we can neither avoid nor remove the cause, we soon learn to endeavour to alleviate it, by exerting some violent voluntary effort, as mentioned above; and are naturally induced to use those muscles for this purpose, which have been in the early part of our lives most frequently, or most powerfully exerted. Now the first muscles, which infants use most frequently, are those of respiration; and on this account we gain a habit of holding our breath, at the same time that we use great efforts to exclude it, for this purpose of alleviating unavoidable pain; or we press out our breath through a small aperture of the larynx, and scream violently, when the pain is greater than is relievable by the former mode of exertion. Thus children scream to relieve any pain either of body or mind, as from anger, or fear of being beaten. Hence it is curious to observe, that those animals, who have more frequently exerted their muscles of respiration violently, as in talking, barking, or grunting, as children, dogs, hogs, scream much more, when they are in pain, than those other animals, who use little or no language in their common modes of life, as horses, sheep, and cows.

"The next most frequent or most powerful efforts, which infants are first tempted to produce, are those with the muscles in biting hard substances. Hence when a person is in great pain, the cause of which he cannot remove, he sets his teeth firmly together, or bites some substance between them with great vehemence, as another mode of violent exertion to produce a temporary relief. Thus we have a proverb, where no help can be had in pain, "to grin and abide;" and the tortures of hell are said to be attended with "gnashing of teeth." Hence in violent spasmodic pains, I have seen people bite not only their tongues, but their arms, or fingers, or any object which was near them, &c.

"If the efforts of our voluntary motions are exerted with still greater energy for the relief of some disagreeable sensation, convulsions are produced; as the various kinds of epilepsy, and some hysterical paroxysms. In all these diseases, a pain or disagreeable sensation is produced, frequently by worms, or acidity in the bowels, or by a diseased nerve in the side, or head, or by the pain of a diseased liver." *Loc. cit.*

To this view of the subject it might perhaps be objected, that the exertions and convulsive motions, if they were excited by the pain, should be proportionate to the violence of the pain; which is not the case. This objection, however,

PAIN.

is entirely obviated by the consideration, that the nervous system suffers a greater degree of irritation from many sensations, that are even in some degree pleasurable, than from intense pain. This is exemplified in respect to tickling. Children have been tickled into convulsions; and perhaps no pain is so intolerable as that of tickling, if the violent efforts of laughing and of moving the limbs were to be restrained. The writer of this article has been informed by a very intelligent gentleman, who is subject to constant and severe convulsive actions, of the nature of St. Vitus's dance, that they are clearly the result of disagreeable sensations, not always amounting to what may be called pain. In this way, it seems to happen, that the most violent and fatal convulsive malady with which we are acquainted, the *tetanus*, or locked jaw, is produced from the irritation of a wound, but not from a deep and open wound, but from a slight abrasion of the skin, or from a wound that is just healed.

Independently, then, of the suffering which pain occasions, its effects on the animal economy are sufficiently severe to induce us to search for the means of relieving it. It never exists long without exciting some degree of fever, and disturbing the functions of life, especially that of digestion; whence also debility and emaciation ultimately follow: frequently it brings on delirium, syncope, or fainting, and convulsions of every species, besides those already mentioned, and even occasions death itself. In many diseases, therefore, it is an important object to alleviate pain, even where such alleviation has no remedial effect upon the disease, of which it is a symptom.

With a view to the successful alleviation of painful diseases, it is necessary to establish a clear diagnosis with respect to the origin of the pain; for the treatment, which will cure one variety, will aggravate another, and even accelerate the fatal termination of the disease which it accompanies.

Violent or *acute pain* originates, in general, from acute inflammation of some organ, or from *spasm* in a muscular part. The former species of pain accompanies inflammation of all the viscera; occurring in the head, in phrenitis, or inflammation of the brain; in the chest, in pleurisy, and inflammation of the heart, or of the diaphragm; in the right side, in inflammation of the liver; in the abdomen, in enteritis and peritonitis; in the loins, in nephritis, and so on. The spasmodic pain occurs in the muscles of the limbs, in cramp; in the bowels, in colic; in the stomach, in gastrodyria; in the uterus, during the time of parturition; and in the muscles of the jaw and of the spine, in locked jaw and tetanus, &c. In some of these cases, the obvious appearance of rigid contraction, or spasm, in the muscles of the pained parts, as in the cramp, locked jaw, and tetanus, is sufficient to point out the nature of the pain. But in regard to the internal pains, the principal source of diagnosis is the presence or absence of a state of *fever*. Acute inflammation cannot exist, without an increased velocity of pulse, which is also commonly strong, or at least hard, and wiry, and not easily compressible under the finger: there will also be thirst, heat of skin, a dry and foul tongue, with failure of appetite, and some prostration of strength. When the pain arises from spasm, the symptoms of fever are generally absent; the pulse is often not altered in its beats, but remains moderate, soft, and compressible; the tongue continues moist, and without fur; there is no particular thirst, nor any sense of heat, succeeding chilliness; and the animal functions are not much disturbed. It is principally from these circumstances that the nature of pain, in any one seat, is ascertained: thus in inflammation of the bowels, and in spasmodic colic, the seat and the degree of severity of the

pain are often precisely similar, and can only be thus decidedly distinguished. Some other circumstances, however, require attention as auxiliary to the diagnosis: for instance, in inflammation, *pressure* upon the part pained aggravates the evil, and a sense of *soreness* is felt under the touch; while, in spasm, the parts are not generally tender, but the pain is often relieved by pressure, and even by *friction*. In inflammatory affections, again, the pain remains *fixed* in one spot, and regular in the degree of its intensity; whereas, in spasmodic ailments, the pain is commonly *moveable*, wandering from one point to another, as the spasm suddenly relaxes in one set of muscular fibres, and recurs in others; and it is commonly *sudden* in its attack, and *remittent* in its degree, being aggravated and alleviated by fits or paroxysms.

The progress of an internal inflammatory disease may often be ascertained, and the nature and period of its termination anticipated, by an attention to the variation of the pain, together with other symptoms. Thus if, after some continuance, an acute inflammatory pain gradually becomes more obtuse, is accompanied with a sense of weight and tension, and at length with a sensation of throbbing or pulsation, it is most probable that suppuration has commenced, and that the disease must terminate in abscess; and there will be no doubt of this, if at the same time the fever begins to remit, and paroxysms of rigour, followed by flushes of heat, come on daily: in other words, if the fever put on a hectic type. Again, if, during the continued severity of the pain and fever, the former should *suddenly cease* altogether, the practitioner is not to suppose his patient recovering: it is probably an indication that *gangrene* has come on, and that the life of his patient is near its close. This will be placed beyond a doubt, if, at the time of the cessation of pain, the pulse loses its sharpness, and becomes small and feeble, with a tendency to coldness in the extremities, and a sinking of strength.

Another material consideration, in estimating the probable event of a painful disease, is the importance of the organ in which it is seated. An inflammation in any of the viscera, immediately subservient to the great functions of the living body, is always attended with danger, especially in the brain, stomach, or bowels; because the functions of these organs cannot be interrupted with safety to the vital machine. But an inflammation, however violent, may occur in the external muscular or ligamentous parts, as in the joints and limbs, without much risk to the safety of the system. It is never to be forgotten, however, that what is called a *metastasis* of such external inflammation to an internal organ, (of which both gout and acute rheumatism afford many examples,) that is, the occurrence of inflammation in some internal viscus, immediately upon the spontaneous disappearance of external inflammation, is always an alarming circumstance, and leads to an unfavourable prognosis.

Of the more chronic varieties of pain, it is not necessary to treat at any length, as they are commonly accompanied by other symptoms of disease, which are equal objects of medical attention, and which contribute to point out the nature of the malady.

The diagnosis being once established, in cases of acute pain, according to the principles above stated, the selection of the proper *means of cure* will be perfectly easy: but if a mistake is committed in determining the first point, the misapplication of the remedies will be of serious injury. For if the expedients, which will presently alleviate spasmodic pain, be administered for the removal of that which is inflammatory, it is scarcely possible that aggravation should not follow; and

and in many cases, on the contrary, when the proper remedies for inflammation are applied for the relief of spasmodic pain, an injurious effect, scarcely less severe, may be expected to result. Yet in the popular practice, no mistake is so common as the former of these errors.

For the cure of violent inflammatory pain, such as occurs in phrensy, pleurisy, and inflammation of the stomach or bowels, evacuations by blood-letting, both general and local, by external vesication, and by the use of cathartics, are the means which must be adopted, and executed with expedition; while every stimulus, in the way of food, drink, and medicine, must be cautiously interdicted, and the whole antiphlogistic system rigidly pursued. But in the feeble and debilitated constitutions, in which spasmodic diseases often occur, such a plan might aggravate the malady, and reduce the constitutional powers to a dangerous state of imbecility. On the other hand, in the constitutions just described, and in most cases of spasmodic pain, the most effectual remedies are opiates, combined with stimulants of the most powerful and diffusible kind, such as alcohol, suspending the stimulant gums and essential oils, ammonia, preparations of ether, &c. Yet it is scarcely necessary to remark, how directly adverse to inflammatory affections such medicines must prove. It is, therefore, lamentable to reflect upon the indiscriminate resort, which is popularly made to spirituous and hot liquors, under all internal pains, especially in their commencement; and the necessity of attending to the marks of distinction above pointed out, or of delaying all remedies until proper medical assistance be procured, in cases of the attacks of such diseases, cannot be too strongly enforced.

PAINS, After, in Midwifery. See *AFTER Throes* or *Pains*.

PAIN-d'Abeiles, a word used by some to express what the ancients called *ambrosia*, or the yellow substance found concentered in lumps on the legs of bees, and supposed by the generality of the world to be real wax.

Experiments made by Mr. Reaumur and others, have sufficiently proved that this substance is not wax, nor has it any of the properties of wax; but it has been conjectured, that this is the matter out of which wax is finally made.

In tracing this substance up to its origin, we find that the bees collect the farina of flowers, which, when moulded by their feet into a lump, makes this matter. It is very probable, that they feed on this matter, and, as some imagine, after passing through certain changes in their bodies, it becomes wax. This was an opinion so old as the days of Pliny; some of the authors he quotes calling this substance *ambrosia*, or the food of these little deities; but later observations overthrew this opinion, till it again got credit under the more accurate examinations made by Mr. Reaumur, on the structure and parts of the bee. This is a food not only eaten occasionally by the bees, but necessary to their support, and is found stored up in their hives against a bad season. The combs have their different cells made for different purposes; and, beside that, some are destined for receiving honey, and some for the young worms which are hereafter to become bees; there are some also which serve to contain this yellow matter, collected on the legs of these insects. In fine weather, when more of this matter is collected than is eaten for immediate nourishment, the bees scrape off the lumps of it from their legs into some of the holes, or cells of the combs, where, others following their example, there finally become large reserves of it; which are eaten on such days when they cannot go out in search of more.

The bee collects this yellow matter, which, according to

Reaumur, is the prime constituent of the wax, from whatever flowers happen to be most plentiful about the hives; and though generally yellow, as the farina of most plants is so, yet it is sometimes seen in red or green lumps on their thighs; but whatever be its natural colour, it is always turned yellow before it is discharged from the body of the animal; and when the stomach of any of them is dissected, after feeding on a red substance collected from flowers, the farina of which is of that colour, the change is found to be made as to colour in this part, for the whole is found there in form of a yellow jelly. This matter, taken out of the stomachs of several bees, and dried, is found to be of a disagreeable smell, like fermented matter, and of a pungency somewhat resembling that of the volatile salts. Mr. Reaumur was hence induced to try the effect of the volatile salts in turning the bees bread, or rough wax, into perfect wax by digestions, continued a long time, but in vain. If we may give credit, however, to the German Ephemerides, there is a much more easy way of reducing this matter, while yet contained in the apices of the plant, into true wax; and that without the assistance of the work of the bees. Mr. David Maja gives an account, in those papers, that the persons he employed in beating roses into conserve, always observed in the pounding of the roses, before the sugar was put to them, that a piece of solid but soft matter was found adhering to the pestle of the mortar, which, on a strict examination, proved to be true and genuine wax. It appeared from this experiment that the juice of the petals or leaves of the roses, was able, by the assistance of beating, to convert into true wax the farina contained in the apices of that flower. Mr. Reaumur tried what effect the juice of roses would have on the yellow matter collected on the legs of the bees, and on the farina of plants, but no treatment he could give these substances was ever able to produce wax. Mr. Reaumur alleges as an absolute proof, that the bees eat the rough wax or bees bread; that, by observing the bees of a certain hive to come home loaded with it every day, several times over, during the month of April, and a great part of May; and after this, opening and examining the hive they belonged to, there were found no new combs, nor were the old bees enlarged in size; it is true, that there were some cells found filled with magazines of this matter, but as the far greater part was brought to no sort of account, it seems very plain that they had eat it. It is to be observed, that the bees have their several periods of going out in search of this matter and of honey: it would be too fatiguing for them to be always thus at work; and to avoid this there is always a very large part of them, even more than half the hive, found at rest within it; these are such as have worked till they are tired, and the others in turn take this manner of resting, and send these out to work again. Reaumur's Hist. Inf. vol. x. p. 68.

But it is necessary to add, that Butler, Purchas, Rusden, and Thorley, very accurate observers of the various operations of bees, have urged several arguments to disprove the identity of the substance now described, and wax. When the hives, they say, have been for a year or more filled with combs down to the floor, and there is no more room to build, the bees carry in this matter in the greatest plenty; and even when no more wax is wanting, besides the small quantity which is required for sealing up the honey and the breeding cells. They also urge, that this substance is very different from wax; as the particles of the former will separate from each other, and be crumbled to powder when examined between the fingers, whereas those of the latter will adhere, and cleave together; and if the one be carried to the fire, it will melt and dissolve, whereas the other will be converted into

into ashes and dust. The difference of the colours of this substance is an additional proof that it was not wax, which, when it is gathered and wrought into combs, is always white, and the change of its colour is owing merely to the age of the combs, and breath of the bees. Besides, it is observed, that new swarms for the first, second, or third day, carry in little or nothing of this matter; though in that space of time they have conveyed into the hive sufficient quantities of wax, formed into several large combs: on the contrary, when they carry in the greatest quantity of this matter, they collect the less wax: because the new swarms want the wax, and the old stocks want food and nourishment for their young. Moreover, Mr. Thorley found upon the belly of a bee, which he caught as it was entering the hive, within the plaits, no less than six pieces of solid wax, perfectly white and transparent: and he has also at other times found wax in the same situation. Thorley's Inquiry into the Nature, &c. of Bees, ed. 1774, p. 106. See WAX.

PAINÉ *Fort, & Dure, in Law*, an especial punishment, formerly inflicted on one, who, being arraigned of felony, refused to put himself upon the ordinary trial of God and his country, and thereby stood mute by the interpretation of law.

This is vulgarly called *pressing to death*. The process whereof is thus described:

"He shall be sent back to the prison, whence he came; and he laid in some low dark room, where he shall lie naked on the earth, without any litter, rushes, or other cloathing, and without any raiment about him, but only something to cover his privy members; and he shall lie upon his back with his head covered, and his feet; and one arm shall be drawn to one quarter of the room, with a cord, and the other arm to another quarter, and his legs in the same manner; then let there be laid upon his body iron, or stone, as much as he may bear, or more; and the next day following, he shall have three morsels of barley-bread without drink; and the second day he shall have drink three times, as much at each time as he can drink, of the water next unto the prison, except it be running water, without any bread; and this shall be his diet, till he dies."

This species of punishment is now discontinued by 12 G. III. cap. 20. See MUTE.

PAINIM, the same with Pagan.

PAINOM JEUNG, in *Geography*, a town of Thibet, on the Painom-tchieu; 122 miles S.S.W. of Lassa. N. lat. 29°. E. long. 89° 8'.

PAINOM-TCHIEU, a river of Thibet, which runs into the Burhampooter; 15 miles S. of Sgigatchee-Jeung.

PAINOUÇ, a town of Chinese Tartary. N. lat. 41° 56'. E. long. 119° 49'.

PAINSWICK, a small market-town in the hundred of Bisley, and county of Gloucester, England, is seated on the southern declivity of Sponebed-hill, at the distance of six miles S.S.E. from the city of Gloucester, and 101 miles W. by N. from London. It is a town of considerable antiquity, being mentioned in Domesday book under the name of Wiche. The manor then belonged to Roger de Laci, who, joining in the rebellion excited by Robert Curthose against his father, was deprived of all his possessions. On this event Painswick became the lordship of Pain Fitz-John, from whom it derived the former part of its present designation. Since that period it has been inherited by several noble personages, and among others by the lords Talbot, one of whom obtained a grant, in the year 1400, to recompense the widows of those persons who were slain in foreign wars, "it having been represented that eleven married men out of sixteen had

lost their lives beyond the sea; and the widows were allowed to marry with whom they list."

Painswick consists of several streets, very irregularly built. The church, dedicated to St. Mary, is the only edifice worthy of notice. This building has a nave, a chancel, and a north and south aisle, with a tower and spire at the west end, rising to the height of one hundred and seventy-four feet. Its style of architecture is mixed and incongruous; the south aisle, which is modern, is supported by Doric pillars, and the entrance is beneath an Ionic portico, while the body of the church is in the pointed style. The spouts under the battlements of the north aisle, represent singularly grotesque heads of demons. In the chancel are several monuments of the Jerningham family.

According to the parliamentary returns of 1811, this town and parish contains 674 houses, and a population of 3201 persons, a great proportion of whom are employed in the woollen trade.

Above the town, on the summit of Sponebed-hill, is an ancient entrenchment, designated by the different appellations of Kimsbury-castle, King's-Barrow, and Castle-Godwin. This fortification is of a square shape, and has a double ditch and vallum. The inner rampart incloses an area of about three acres, and as well as the outer one is still of considerable height, though both have of late years suffered great dilapidation for the sake of the stones employed in constructing them. This encampment is supposed to have been of Roman origin, as coins of that people are frequently dug up within its area. It was afterwards, however, occupied by earl Godwin during the insurrection made for the expulsion of all foreigners from the kingdom; and again by the royalist army after the siege of Gloucester, in the time of the grand rebellion. The position of this entrenchment, in a military view, is excellent, as from its loftiness it overlooks a large tract of the adjacent country.

Haresfield parish, to the westward of Painswick, contains some vestiges of antiquity. On the high ridge of hills, which shelter the village, is a very singular entrenchment, conjectured to have been a station of the Romanized Britons. It extends on one side 600 yards in length, and is defended by a single vallum fifteen feet high. Connected with this work is another, (partly in the parish of Standish,) which incloses the bold promontory, called Beacon-hill, by a "transverse vallation fifty feet deep, and containing fifteen acres." At Harescomb is the site of an ancient castle of the Bohuns. Beauties of England and Wales, vol. v. by E. W. Brayley and John Britton, F.S.A. Bigland's History of Gloucestershire, vol. ii.

PAINT, BLACK OIL, in the *Arts*, is prepared by grinding, with a proper quantity of oil, the charcoal or soot blacks, or the natural black earths, or the pit-coal, till they are united into a smooth, uniform, thick compound, which is occasionally diluted with more oil to a due consistence for being worked freely with the brush or pencil. The finest black colour is made with ivory black, ground before the addition of the oil, into an impalpable powder. The material most commonly made use of is lamp-black, the unctuousness of which disposes it to mix more easily and perfectly with oil than other pigments; but it derives hence the imperfection and disadvantage of drying slowly, which may be remedied by a due preparation of the oil; as by setting it on fire, and boiling it, as in the method of making printing-ink. An opaque deep black paint with water, is made by grinding ivory-black with gum water, or with the liquid which settles from white of eggs, after they have been beaten up and suffered to stand a little. Some use gum-water and the white of eggs together; and observe that a small addition

of the latter makes the mixture flow more freely from the pencil, and improves its glossiness. Lewis's Com. Phil. Techn. p. 356, &c.

PAINTED LADY, among the *Florists*, a term for a particular sort of carnations, the flowers of which have all their petals red or purple on the outside, and white underneath.

PAINTED Lady Pea, in *Gardening*, the common name of an ornamental pea. See LATHYRUS.

PAINTED Post, in *Geography*, a township of America, in Steuben county, New York, on Tioga river, between Bath and Newtown; containing 262 inhabitants.

PAINTEN, a town of Bavaria, in the principality of Neuburg; 11 miles W. of Ratibon.

PAINTER, in *Naval Language*, a rope employed to fasten a boat either alongside of the ship to which it belongs, or to some wharf, key, &c. as occasion requires. See SHANK-*Painter*.

PAINTER, in the *History of the Arts*, one who possesses and practises the art of painting.

PAINTER'S Harbour, in *Geography*, a port on the W. coast of Cape Breton. N. lat. 46° 22'. W. long. 61° 16'.

PAINTERS, House. The price of painters work is limited by statute, and they shall not take above 16*d.* a-day, for laying any flat colour, mingled with oil or size, upon timber, stone, &c. and plasterers are forbid using the trade of a painter in London, or to lay any colours of painting, unless they are servants to painters, &c. on pain of 5*l.* But they may use whiting, blacking, red lead, ochre, &c. mixed with size only, stat. 1 Jac. I. cap. 23.

Painting is measured by the square yard in the same manner as waincoting, the mouldings being measured by a thread; the sashes of windows are paid for by the piece; and it is usual to allow double measure for carved mouldings, &c.

PAINTING, the Art of, is the art of imitating the appearances of natural objects, by means of artificial colours spread over a surface; the colouring substances being used either dry, as in crayon painting; or compounded with some fluid vehicle, as oil, water, or solutions of different gums and resins in oil or spirits, &c.

The theory and practice of this ingenious and delightful art, are divided by its professors into five principal parts; *viz.* *invention*, or the power of conceiving the materials proper to be introduced into a picture; *composition*, that of arranging those materials; *design*, that of delineating them; *chiaro-scuro*, or the arrangement and management of the lights and shades, and of light and dark colours; and *colouring*, whose name sufficiently designates its end.

Each of these principles we have already amply discussed in separate articles; and our readers will also find the more minute, though not less useful, subdivisions of them explained and illustrated under their respective designations. (See EFFECT, ELEGANCE, EXPRESSION, &c.) We shall in this place, therefore, confine ourselves to the treatment of the subject generally, rather than technically; and trace its history from its first application as an arbitrary means employed to relate or record a mere fact, in a rude and formal manner, such as it was found practised among the Mexicans, (see Robertson's America,) to that high state of cultivation, when it was employed to soften and mould the heart, by impressing it with sentiments at once moral, lovely, and energetic.

Nature has denied to few the passions and feelings which are the basis of the imitative arts; and most men delight in beholding their productions. The desire of imitation appears to be so congenial to the mind, that one can scarcely

imagine there could have been any lengthened period of time when it was not called into action, as an agent, either of amusement, of information, or of instruction. Of drawing or painting more particularly, it appears reasonable to suppose, that it must have been adopted for either or all of these purposes, in the earliest stages of human society; though in its very simplest and rudest form.

It will be therefore a vain attempt, if we endeavour to trace the period when the art began its original essays, as an assistant towards communication between man and man; as a means of adorning their persons, or amusing their minds. A state of indolence and ignorance, such as that of savage nations whose sole occupation, dictated by necessity, consists in procuring the necessaries of life, by becoming acquainted with the productions of nature, never appears to have prevented the practice of the ruder elements of it; and it is not improbable that the waste of time between the active periods of exertion in the chase, might itself have been the cause of the first step towards imitation. In pure indolence of thought, or by accident, the first trace of form might have been made in the sand, or on the body; or resemblances observed in sticks or stones, have given rise to the idea of imitating by lines and colours the appearances of natural objects. Among the rudest, most uncultivated nations which our circumnavigators have within the two last centuries discovered, unless it be the natives of New Holland, and that may admit of a doubt, none are without the rudiments of art. Some exhibit it by carving what they consider as ornamental forms, &c. on their instruments of war, their idols, or their utensils. Others, in more refined attempts, adorn their persons by coloured lines and figures; puncturing their skins, and rubbing in powders of various colours, which become by that means indelible. All display the influence of natural principle in this particular; and from these rude employments of the inventive and imitative faculty, the progress appears neither unnatural nor difficult, till we find it adopted as a substitute for language; transmitting an image and record of events before the invention of writing; and even in a more universal, though in one view more confined manner, than that later invention is capable of.

Although thus early the art of painting may be supposed to have allured the attention of men, to have excited their inherent taste for imitation, and in this find the basis of a durable principle for itself whilst mankind exists; yet, when the mere object of conveying ideas was once completed, its advance towards that cultivation of which we now know it to be capable, was extremely slow. Being more an adjunct to the pleasures than the necessities of human life, it could not experience that attention which alone carries it forward, when time was occupied almost exclusively in procuring necessary food; and before intellectual education had made men acquainted with its true value. Painting may exist in a state of ignorance, but has never been known to flourish, except at the periods wherein human cultivation was most assiduously encouraged, and ardently pursued; and even in the highest stages of mental acquirement, and when that art was most devotedly admired, and industriously practised, it struggled with difficulties proportioned to its value, and the delight it is calculated to afford; and few have been the happy mortals who have enjoyed the blessing of shining pre-eminent in the exercise of it.

Such are the uncertainties attending the traditional history of the progress of the arts of design in the countries to the east of Syria, which relate to the probability of their having been first practised there, and thence travelled through

PAINTING.

Persia to Egypt, where they are said to have been domiciliated six thousand years before they were introduced into Greece; that we shall not scruple to lay them aside, and commence our history of painting from the time when we have the earliest actual account of its existence; *viz.* in the reign of Ninus and Semiramis, king and queen of Assyria; about 2000 years before the commencement of the Christian era. Of the art of painting at this period, we have but a glimpse, and are then immersed in the same obscurity as before, where nought but conjecture and arguments drawn from subsequent events are the guides.

Diodorus Siculus relates, lib. ii. "that Semiramis having thrown a bridge over the Euphrates at Babylon, erected a castle at each end of it, and enclosed them by three walls of considerable height, with towers upon them;" these were built of brick, painted and burnt. These paintings exhibit a very great advance in the arts for that early period; for he says, "the bricks were painted before they underwent the fire," (so that, if this account be correct, here was enamel as well as painting), and that not only there were single figures of animals represented in colours, but they were also combined in groups; one, a hunting piece of considerable length, wherein the queen herself was represented on horseback, throwing her dart at a panther; and near her Ninus striking a lion to the earth with his spear." They were of great extent, covering walls and towers attached to them. One other mention of painting is found in the same author, concerning the same period, and under the guidance of Semiramis; and that is, of paintings in the temple dedicated to Belus, and founded by her. In them were represented monstrous figures, exhibiting hermaphrodites and centaurs; or unnatural combinations, probably allusive to the idolatry of the time. Diodorus also mentions the situation of the arts in Egypt at about the same period, where probably they had attained nearly the same degree of cultivation: sculpture, as best serving religious purposes, being in both countries carried much farther than the sister art of painting.

From Egypt the arts were supposed to have been transplanted to Greece, where a more genial culture awaited them; where they had not to struggle with such impediments as arose from the government and habits of Egypt; and where alone, in the more early period of the world, they are found to have been fully brought into action. In other countries, where any trace is visible of them, wrought before the Greeks had exhibited their power, the best exemplars are little better than hieroglyphics; and most probably they never far exceeded the efforts of youthful learners of the present day.

It is, doubtless, to the Greeks alone we are indebted for the highest cultivation which the imitative arts have known. In sculpture they attained so high a pitch of excellence, as to remain unrivalled to this moment; and it is probable, that as far as relates to the perfect imitation of a single figure, in taste, in expression, and in execution, the same may be said of their painting: but there is much reason to conclude, that in many branches of that art they are surpassed by the best among the moderns. In Egypt, the knowledge of what is most desirable in art, selection, never appears to have operated far. When a specific form of character was once adopted, there it remained, and was repeated unchanged for generations. Little action was given to figures, and no attempt at all at expression. Pliny says, that the statues made by the Egyptians in his time, differed in no respect from those made by them 1000 years before. Of their painting, a few figures remain to us; but their date is by no means clear. Two of them, seen at Thebes,

and described by Bruce, are supposed by him to be of the time of Sesostris (about 700 years B.C.), who is said to have beautified and restored that city; but this is mere conjecture. Of these paintings, he remarks, that they may be compared with good sign-paintings of his day.

It appears very probable that the practice of improved art, improved in comparison with the very rudest periods, was very widely diffused. Pliny, besides mentioning the culture of it in Egypt, speaks of paintings at Ardea in Italy, older than the foundation of Rome. Unfortunately we cannot follow this author precisely, in his account of the rise of the art in that country, any more than in Greece. By his own statement, the only guides he had, except tradition, *viz.* the Greek writers, were extremely incorrect. But though we may not trust our judgments with him on the era of the rise of painting, yet the plan he offers us of its progress, the imperfection of its first essays, the gradual advance towards perfection by the addition of new and more valuable qualities, and the retrograde steps it fell into after it had reached its acme, present an order of things so precisely following the system of nature in every part, that we cannot hesitate to give complete faith to it.

After smiling at the claims of the Egyptians, who said that the art had been known and practised in Egypt 6000 years before it was introduced into Greece, he says, that it was not practised in Greece till after the siege of Troy; a circumstance certainly not credible, if the story above related of Semiramis be true; and if Homer be correct in imputing so much of sculpture as he does to the artists of that period; or the amusements of Penelope, of Andromache, and of Helen, at their looms, be at all founded in fact. It is not probable that so much of other arts, particularly of weaving coloured designs, should exist, without some advance being made at the only source whence it is natural to imagine they could arise. It is vain to discuss the point; nor is it of much consequence whether it were at Corinth or at Sicily that the practice of drawing first attracted particular notice. But, as Mr. Fuseli has beautifully observed in his first lecture, "if ever legend deferred our belief, the amorous tale of the Corinthian maid, who traced the shadow of her departing lover by the secret lamp, appeals to our sympathy to grant it."

The first essays, then, of this delightful art were merely outlines of a shade, such as are still made use of in that agent of the science of physiognomy, termed a *silhouette*; with no line within, no shade, or colour; and they were therefore called *skiagrams*. The next step was to the monogram, or lines within the outline; and afterwards to the monochrom, or outlines filled up with one single colour. This, by study, and a more scientific mode of proceeding, advanced to the polychrom, or picture of many colours; and at length was perfected by that harmony of tone, so exalted in the hands of Apelles and his contemporaries.

Pliny mentions the name of Saurias, as one who practised the earliest stage of the art, and of his drawing the figure of a horse; and of Philocles the Egyptian, Cleantes of Corinth, Ardices of the same place, and Telephanes of Sicily, who advanced to the monographic. Cleophantes of Corinth is said to have been the first who practised the monochromatic, and his colour to have been that of a pounded tile. In concurrence with him, or after him, wrought Hygiemon, Dinias, and Charmas; and probably one of these improved the monochromatic style, so as not to make a whole picture, containing many figures, of one colour in every part; but varied the colours, so as to characterise the different objects introduced. According to Quintilian, (lib. ii. c. 3.) "they could so manage the single colour, which they used in the monochro-

PAINTING.

monochromatic style, as to give every appearance of relief to parts;" but by what means, as light and shade appears not to have been observed, he does not say. After these came Eumarus the Athenian, and Cymon of Cleonea; to the latter of whom, Pliny gives the praise of having greatly advanced the art, by giving variety of attitudes to his figures, attending to the folds of draperies, and more discriminatingly marking the joints and veins of the body, than had been done by his predecessor.

To the existence of none of the above-mentioned artists does Pliny, or any other author, affix a date; but he contends, and with reason, for that of an established and important fact in the history of the art, *viz.* that about the 16th Olympiad, or little better than 700 years before the Christian era, Candaules, king of Lydia, purchased a picture, painted by Bularchus, called the battle of the Magnetes, and gave for it its weight in gold: a tolerably sufficient proof of the high esteem the art was held in at that time; though we ought by no means to deduce from it, that Bularchus had arrived at any other degree of perfection, than what placed him among the best of his day; and it tells but very little as to the actual state of the art at the time: since, in its infancy, the patron could only be guided in his judgment, by what had preceded; and the best, though moderate, has always received the highest eulogiums from those who, of necessity, are ignorant of superior exertions.

Whatever was the degree of excellence to which the immediate successors of this fortunate painter carried the art, we must be content to remain entirely ignorant of it. Possibly the confusions of civil anarchy and of foreign wars, which followed this period, and brought Athens, and indeed all Greece, near to destruction, prevented, in a great degree, the exercise of an art, which requires the fostering aid of peace, of science, and of patronage flowing from the hand of power.

When intestine commotion had subsided, and Xerxes had been driven out of Greece, then the depression under which her inhabitants had groaned was removed, and her spirit revived, exalted by a sense of its own dignity and importance. Genius then stepped forth from its retreat, encouraged and rewarded. The liberal arts, aided by the general cultivation of mind which then took place, were summoned to assist in erecting monuments to the heroic deeds of the national heroes; and again we are enabled to trace the steps of painting, still weak and tottering in her gait at first, but soon advancing with amazing rapidity towards the highest point she is supposed ever to have reached.

Sculpture was most probably practised with continued success, even during the times of distress and warfare. The necessities of the idolatrous religion, which so powerfully controuled the Greeks, might alone have required the exertion of all the talents the country could produce. We can no otherwise account for the immense advance which that art is found to have made before painting, at the period of which we are speaking. Phidias, who was the most renowned among sculptors, guided the hand of his brother Panæus, (the first painter whose name occurs after the re-appearance of the art,) in adorning the walls of the portico, called Pœcile, at Athens; where he painted the battle of Marathon, and introduced into it the portraits of the principal commanders, both Greek and Persian. But how great was the difference between their powers! The former, among other works, had produced those in the temple of Minerva, called the Parthenon, which to this day remain a source of admiration and of envy; while that of the latter, as described by Pausanias (*Atticæ*, lib. 1. c. 16.) exhibit

his art still in its infancy: although Pliny observes, that the painters were then supplied with colours better suited to their purpose; and thus proves, that the practice of it had continued in cultivation, however slow its progress. To Panæus, however, Greece was indebted for an anxious zeal to advance the art he practised, to a more equal station with sculpture; and in his time, prizes were instituted at Delphos, and at Corinth, for its encouragement; where he himself contended, but was excelled by Timagoras of Chalcis.

Just so far as to have become the partial and humble rival of sculpture in bas-relief, with the exception of colour, had painting at this period proceeded; and even Polygnotus of Thasos, who succeeded Panæus, advanced it no farther than a more vivid imagination, acting upon the same system, might rationally be supposed to have done. He also was employed to paint in the Pœcile at Athens, and in the Lesche, or public hall, at Delphos. Three of his pictures in the latter place are minutely described by Pausanias. (*Phœciæ*, c. 25. et seq.) The same imperfect elemental principle is their basis, as in that of his predecessor, or rather perhaps his contemporary; at least in part; for Pliny says, Polygnotus was prior to the 90th olympiad, and Phidias is known to have died in the first year of the 91st (432 years B.C.) The pictures by Polygnotus, which were at Delphos, were works of immense labour, from the number of figures introduced in each; but they were entirely without any idea of composition, perspective, or chiaro-scuro. Each figure had its appropriate action, consistent with its history and character; but no connection in lines with its neighbour: and that the observer might be at no loss of time in considering whom they represented, the painter had placed a name to every figure. They were arranged in rows, beside, or over, each other; and Pausanias, in describing them, begins at one end, and proceeds with an individual enumeration of them to the other, and then speaks of other figures over these; but whether they diminished in size, does not appear. Yet Polygnotus was a man endowed with uncommon talents, and certainly advanced his art very far in point of expression and action in his figures, and in ideal colouring. Of this, his figure of the demon Eurynomus in one of the pictures above-mentioned, *viz.* of Ulysses consulting the shade of Tiresias in Hades, is a sufficient proof. "His colour," says Pausanias, "is between black and azure, like that of flies who infest meat; he shews his teeth, and sits upon the skin of a vulture." Pliny also says of this artist, that he was the first who dressed his female portraits in gay colours, and he has been highly complimented by Lucian, who invokes his aid to accomplish his perfect woman. "Polygnotus," says he, "shall open and spread her eyebrows, and give her that fine glowing decent blush, which so inimitably beautifies his Cassandra. He likewise shall give her an easy flowing dress, with all its delicate wavings; partly clinging to her body, and partly fluttering in the wind."

It could not be many years after the time of Polygnotus, or perhaps it was even during his life, that another step in advance was made in the art of painting, by Apollodorus of Athens; whose name is particularly mentioned by Pliny as having discovered the principle of beauty, or rather having first adopted it in painting; for it had long been known and practised in sculpture. From this period, the art assumes its most essential character, and its most pleasing one; making man its object, not individual men; the genus, not the species; except in the more humble work of portraiture. By this sentiment, Pliny must himself have been actuated, when he says, that "before Apollodorus, none were worthy

PAINTING.

of record as artists; and that no picture had till then been produced, which a man might take pleasure in observing for any length of time."

The system of Apollodorus, to whatever height he bore it, was eagerly embraced by his pupil and successor Zeuxis of Heraclea; of whom his master did not deem it derogatory to himself to say, (in some verses which he wrote,) that "the art of painting had been stolen from its professors, and practised by Zeuxis alone." Uniting the simple but energetic style of Polygnotus, with the peculiar selection and taste of his master, he certainly appears to have surpassed both. It is the remark of Quintilian, that he considered the poetic unity of character adopted by Homer, in the descriptions of his heroes, as his model; and gave to each individual he painted, the peculiar distinction of a class. This must have been his object, at least in the picture of Juno, which he painted for her temple at Agrigentum, according to a vow which the inhabitants of that place had made. For before he began the picture, he desired to see all the most beautiful maidens of the city naked, and from them he chose five, whose form he most admired; intending to exhibit the most perfect combination of female forms, by selecting and adopting the most beautiful parts of each.

Timanthes, Eupompus, Androcydes, and Parrhasius the Ephesian, all flourished and were renowned together with Zeuxis; the first, and the two last, however, bore the sway of skill and of public favour. Among the principal productions of Zeuxis, are enumerated, a figure of Penelope, wherein he is said not only to have given her a becoming person, but also to have expressed the qualities and affections of her mind. Another of Jupiter on his throne, accompanied by the gods. Hercules strangling the serpents in his cradle, in the presence of Alcmena and Amphictyon: and of a wrestler, or champion; with which he himself was greatly delighted, and wrote underneath it, "that it would be more easily envied than imitated." Having acquired great riches, he refused to paint any longer for money, and gave away his pictures; declaring they were above all price. Of him and his rival Parrhasius, it is difficult to say which carried the art to the greatest extent, or was most vain-glorious. The story which Pliny relates of their contest, by no means settles the former; as both their pictures were mere matters of imitation, and could have little to do with their real excellencies, except in colouring. But if the fact be true, it is a wonderful instance of their perfection in that point; and totally excludes the possibility of belief in what he says concerning the colouring materials with which they were acquainted, and used, *viz.* only four; and those were impure and imperfect in themselves. A curtain might, indeed, be of a dull colour, and possibly such an one Parrhasius might have imitated, with such materials, and so perfectly, as to have deceived Zeuxis; but it is to be presumed the luscious transparency, colour, and brilliancy of the grape in those days, were not very widely different from what it now exhibits; and those pure qualities can only be imitated by the purest and most perfect of colours. Zeuxis, indeed, having himself mistaken the painted curtain of Parrhasius for a real one, was obliged to acknowledge himself surpassed; or must have submitted to the inference, that his penetration was not superior to that of the birds whom he had deceived. It was remarked, in favour of Parrhasius, that he had a purer eye to proportion and symmetry, which he is said to have reduced to rule; that he rounded the boundaries of his figures into their grounds, better than those who had preceded him; and that he superadded the charms of grace in the action of the body and features, and in the disposal of

hair and draperies. With these qualifications, if justly given him, he claims the pre-eminence; though perhaps in the compliment which Pliny pays him concerning the softness of his outline, he himself might have been deluded by the agreeable effect of such a procedure; whilst it may have been carried to a fault by Parrhasius. Such an inference may certainly be fairly drawn from the observation of Euphranor upon his picture of Theseus, which, in comparison with his own, he said, appeared to have been fed on roses: implying, probably, that it wasted substance as well as colour. As the vanity of Zeuxis led him to have his name embroidered in gold upon the border of his robe, when he attended at the Olympian games; that of Parrhasius induced him to wear a purple robe and a golden garland; to bear a staff wound round with tendrils of gold; and to have sandals tied to his feet and ankles with golden straps. He styled himself *Abroditus*, the dainty or delicate, and declared he was descended of Apollo; and that he had nightly visits by Hercules, while he was painting a picture of that divinity. The emperor Tiberius was so delighted with a picture of his, of an Archigallus, or chief priest of Cybele, that he kept it constantly in his own room, and valued it at 60,000 sesterces, 48*l.* 10*s.* Pliny mentions many of his works, and also that though he was thus skilful, he was excelled, according to the opinion of the Samians, by Timanthes, in a picture of Ajax at the award of the armour of Achilles to Ulysses: whereon he simply remarked, that his regret was only, that such a hero as Ajax should have been overcome a second time, by a man unworthy of the honour!

The quality for which Timanthes is renowned, is vigour of imagination. This aided him to fill the decided corporeal forms, now fixed as characteristic, with passion; and it is sufficiently illustrated by that well-known circumstance of the peculiar action given by him to his figure of Agamemnon, in the picture representing the sacrifice of Iphigenia; and by the mode in which he embodied the idea of grandeur in stature, in a small picture of a Cyclops; *viz.* by introducing some satyrs, supposed to be of the usual size of man, measuring the length of the giant's thumb with a thyrsus. One of his pictures remained at the time Pliny wrote, about 400 years afterwards, in the temple of Peace, at Rome. He calls it the portrait of a prince; and says, "it is so perfect, and so full of majesty, that it appears to comprise every thing desirable in the art of painting."

The art continued advancing by rapid degrees at this period. Nature, in form, in colour, and expression, was the guide; and to develop her beauties the sole object of the artists. Eupompus sufficiently displayed this basis, in his advice to Lyfippus, the sculptor, who enquired of him, whom among his predecessors he should make the objects of his imitation. "Behold," said the painter, shewing his friend a multitude of characters passing by, "behold my models! From nature, not from art, by whomsoever wrought, must the artist labour, who hopes to attain honour and extend the boundary of his art." (Pliny, lib. xxxiv. c. 8.) To such a pitch of excellence was painting at this time advanced among the Greeks, that it became highly esteemed; was thought worthy of being ranked at the head of the liberal arts; was ordered to be taught to the sons of the higher classes, in preference to all other things, according to Pliny, and forbidden to be practised by slaves. Such was the honour done to it, by the influence which the painter Pamphilus of Amphipolis had acquired. Of him it is remarked, that he was the first who proved the value which the art acquired, by an union with science and literature; and to him,

him, Apelles, the unrivalled hero of Grecian painting, was indebted for his initiation to its mysteries.

This extraordinary man (Apelles) appears, if we give full credit to the traditions concerning him, to have been endowed with a more perfect combination of rare talent and excellent qualities, than has, either before or since, fallen to the lot of any other. He had, besides, the peculiar felicity of being born at that period when his country was at its highest pinnacle of cultivation; so that mankind saw in him the happy union of a perfect mind, strengthened and guided by the best assistance education could possibly afford. Not only as an artist is he extolled above all others, but equally so as a man; for his gentleness, his amiability, generosity, and magnanimity. Pliny places the time when he flourished, in the 112th Olympiad, (328 years B.C.); and adds, that he became so consummate in the art, that he alone enriched it more than all his predecessors had done; and compiled several books upon it, wherein he illustrated its principles. It is agreed by all writers, who speak of him, that in him, the art of painting reached its acmé. He himself indeed acknowledged, that he was surpassed by several artists in different branches of its practice; by Amphion in disposition, by Asclepiodorus in proportion, &c.; but that in the combination of the whole, he excelled them all.

Yet it is not without some grains of indulgence, this most liberal praise is to be received. It is extremely difficult to know how far to attach real value to the language of praise, as given to works of art; so much depends upon the taste and judgment of him who bestows it. The highest terms of praise will always be given to the best works of their time: and therefore we find, that at all periods contemporary authors have expressed the same degrees of approbation, and in nearly the same terms, of the pictures they have seen produced; whilst we know, that as art was slow in its progress, it is impossible, that in all its varying stages, it would have merited equal praises. No doubt, however, can remain, but that Apelles was a most powerful and agreeable painter; and that he must have given a degree of taste, of grace, of life and effect to his figures, which had never till then been equalled in their union, is evident, since it is the general unvarying opinion of all writers who have mentioned him; and they are neither few nor weak. As many of his pictures were preserved at Rome in the time of Pliny, he had an opportunity of judging for himself; as far at least as their condition after such a lapse of time (nearly 400 years) would allow him; but the tribute which he pays to the excellence of his mind is of course deduced from the reports of others. There appears in the latter no extravagant hyperbole which leads to disbelief; and his generous conduct towards so powerful a rival as Protogenes, well deserves the honourable mention made of it. Being highly delighted with a picture of Jalyfus, painted by that artist, he sailed to Rhodes on purpose to visit him; where finding him neglected and in poverty, he purchased some of his works, and declared, that he intended to sell them as his own. Roused to a recognition of the talents of their fellow citizen by such powerful testimony as that of Apelles, they raised him from his humble situation to rank and fortune.

The well-known contest of these two friendly artists, in the lines they drew as designatory of themselves, exhibiting that taste and skill which they knew none but themselves possessed, stands upon well founded testimony as a fact. The tablet whereon they were drawn remained untouched, was taken to Rome, and was there seen by Pliny himself; who speaks of it, as having the appearance of a large blank

surface; the extreme delicacy of the lines rendering them invisible, except on a close inspection. They were drawn with different colours, one upon, or rather within, the other. To judge from his account of it, it might be supposed, that all the beauty lay in the extreme delicacy of the points which had been used, and of the hands which had applied them; but it is reasonable to suppose, that the first direction of the line might have some principle of beauty for its guide, by which, as well as by the neatness of its execution, Protogenes was instantly moved to the declaration, that none but Apelles could have drawn it!

Beloved, honoured, and employed by Alexander, Apelles had the happiness of enjoying that fullness of renown, to which he was so justly entitled. Alexander, the envy and admiration of the world, treated the painter with the familiarity of a friend; ordained that none other should presume to paint his likenesses; frequently visited him; and crowned his favours by a sacrifice to friendship of a most uncommon nature among men: depriving himself of a beloved object, his favourite Campaspe; and giving her to gratify the affection of one whom he so much esteemed.

The pictures produced by this exalted artist were numerous, and are mentioned pretty much at length by Pliny, lib. xxxv. cap. 10. But perhaps the best comment upon his talents as a painter, will be found in the character Mr. Fuseli has given of him. He places him in that rank where every thinking mind will be gratified to find him. "The name," he observes, "of Apelles in Pliny, is the synonyme of unrivalled and unattainable excellence; but the enumeration of his works points out the modification which we ought to apply to that superiority: it neither comprises exclusive sublimity of invention, the most acute discrimination of character, the widest sphere of comprehension, the most judicious and best balanced composition, nor the deepest pathos of expression: his great prerogative consisted more in the union than the extent of his powers; he knew better what he could do, what ought to be done; at what point he could arrive, and what lay beyond his reach, than any other artist. Grace of conception, and refinement of taste, were his elements, and went hand in hand with grace of execution, and taste in finish; powerful, and seldom possessed singly, irresistible when united."

That our readers may judge for themselves of the propriety of these remarks, we will enumerate from Pliny the pictures of which he speaks, and which of course may be supposed to convey a very just idea of the class of subjects generally chosen by Apelles. Of Alexander the Great, and his father Philip, the portraits he painted were very numerous; some single and some accompanied by other figures. One in the temple of Diana at Ephesus, of Alexander launching thunder, is highly extolled for its effect, and the boldness of its relief; "the hand which was raised appearing to come forward, and the lightning to be out of the picture:" in another of the same king, he was represented in a triumphal chariot, near him the figure of war, with his hands tied behind his back. This, and another Alexander, accompanied by Castor and Pollux, and a figure of Victory, were preserved by Augustus in the forum. Many other portraits are mentioned; viz. of Antiochus, king of Syria; of Antigonus; Archelaus with his wife and daughter; Abron, an effeminate debauchee; Clytus on horseback, armed, except his head, with an attendant delivering his helmet to him; and of Megabyfus, a priest of the temple of Diana at Ephesus, sacrificing, in his pontifical vestments. In subjects of fancy, are, a Diana surrounded by her nymphs, attending at a sacrifice; Neoptolemus, son of Achilles, on horseback, contending with Persians; Hercules with his

PAINTING.

back towards the observer, and his head turned round so as to shew his face; a horse painted in competition with other painters, and said to have excited living horses to neigh; and lastly, his renowned picture of Venus rising from the sea; which being taken to Rome was dedicated by Augustus in the temple of Julius Cæsar; and several Greek epigrams upon it, are preserved in the Anthologia. So great was its perfection, that no artist could be found who would undertake to restore the lower part of it, when by accident it had been injured: and of another of the same subject, begun for the inhabitants of his native island, (Cos,) and of which he had only finished the head and breasts when he died, Pliny says, that no painter would set his hand to complete it; through a fearful acknowledgment of this great master's superiority. Other pictures and designs of his are mentioned by different authors, but these are sufficient to shew the general tendency of the subject: on which he employed the extraordinary powers of imitation he was endowed with. The bare mention of them is sufficient to prove the critical acumen of our learned professor of painting; but doubtless they are fully capable of admitting, indeed they require, all that grace and taste in conception and execution, for which he was renowned, to compensate for their want of pathos.

What was omitted by Apelles, was supplied by his contemporary, Aristides of Thebes. Unable to rival him in harmony and grace of colour and execution, and qualified by nature to display the influence of the passions, Aristides followed in the steps of Timanthes. His was the power of impressing form with soul, of fixing upon, and representing with effect, those impassioned actions of the body, which are the result of the more amiable or violent emotions of the mind. So effective was the earnestness of a suppliant portrayed by him, that "his voice seemed to escape from the picture," and not only was he capable of representing the more simple emotions of the passions; but their most complex unions were also subject to his skill. An expression, in which are discoverable maternal affection, anxious for the benefit of its offspring, amidst the pangs of certain and approaching death, was produced in his picture of a woman who had received a mortal wound upon her breast, endeavouring to prevent her infant, eager for its nourishment, from sucking her blood instead of milk. (Pliny, lib. xxxv. c. 10.) The mind dwells with apprehensive commiseration on the bare relation of the image; and great, indeed, must have been the discriminative power of mind, and of hand, to execute justly, so difficult a task. Although Aristides appears to have most delighted in subjects which afforded him an opportunity of displaying his knowledge of the human mind, and its pathognomic influence upon the body; such are his pictures above mentioned, and those of a sister dying for love of her brother, and of one suffering under the languishments of illness; yet he sometimes ventured upon a more extended field, and in one instance painted a picture of a battle between the Greeks and Persians, in which were introduced 100 figures, and was paid by Mnason, king of Elatea, 10lbs. of silver for each of them. In another he represented a race of chariots with four horses; of which, Pliny observes, "you would almost think the wheels were in motion, such was the energy of action in the picture."

At this time, the art of painting was upheld in Greece by a great number of ingenious men renowned for their distinctive excellencies. Asclepiodorus for the beauty of symmetry; Protogenes, for exquisite skill in execution and finish; and in him the art received one of the highest tokens of regard it was ever favoured with; for when Demetrius Poliorcetes was besieging the city of Rhodes, and might have taken

it by assailing it on the part where Protogenes resided, he forbore, lest he should do an injury to his works; and when the Rhodians delivered the place to him, and requested him to spare the pictures of their admired artist, he replied, "that he would sooner destroy the images of his forefathers, than the productions of Protogenes."

With these artists, and a few others, as Nicias, Nicomachus, Mnason, Aristodemus, &c. all nearly contemporaries, this delightful art arrived at its utmost height; and though it continued to be practised by a succession of ingenious men, many of whose names are handed down to us, and who contended against the formidable difficulties presented by the scenes of luxury and confusion which opposed them, yet their efforts to uphold its dignity were in vain. When the country, weakened by domestic broils, became subjugated by the Romans, its arts and its energies expired with its liberties; the spirit which animated the arts in Greece being removed, they fell to rise no more, at least for ages. But the cycle of nature will have its course in the arts, as well as in governments, and in man himself. All sublunary things have within them the seeds of their own destruction; and having reached the acme of excellence in their kinds, their further progress in existence can only be retrograde.

In the means left to us for tracing the history of painting in Greece, many are the deficiencies we have to deplore; but in nothing more than the want of pictures, and the entire loss of the treatises written on the principles of the art, by Apelles, Parrhasius, Protogenes, and Perseus, a pupil of the former, to whom he dedicated his work. If, happily, these had been preserved, we might have been able to decide upon the state of the art and the merits of its professors, with much greater accuracy than from the remarks of mere critics, however acute and industrious; who are now our only resource. The liability to error and misguidance of such, none can be at a loss to determine, who have perused the extended labours of Winkelman, Du Bos, and others upon subjects of this nature; where, though surrounded with great ingenuity in antiquarian research, ignorance of the technical parts of the art is made apparent by affected allusions and frequent misapprehensions, which the mere tyro in practice would detect; and where a display of classical learning appears to have been more an object of the authors, and for which they were better qualified, than a just extension of the principles of art, or instruction in the practice of it.

From the information we still possess upon this subject, it is extremely difficult to decide upon the exact degree of cultivation the Greeks attained, in many branches of the art of painting, as now understood. We have sufficient data to ground a satisfactory belief, that in the most essential points, as fullness of invention, expression, grace, character, and design, they rivalled the sculptors of the best periods; and that they carried colouring to an equal degree of perfection, (though by some doubted,) appears to us not improbable. But whether they ever understood and employed composition, as it is now scientifically practised, as far as relates to the union or separation of groups, and effecting the distances of given objects according to the rules of linear or aerial perspective; or whether they at all comprehended and practised the science of chiaro-scuro, as employed by subsequent schools of art, we have yet to learn. On these points the descriptions of their productions afford no conclusive evidence.

It must be observed, that the criticisms employed by the ancient writers partake very little of technic information; nor appear to have arisen from any thing like technical knowledge; the

PAINING.

the only source from which any very satisfactory information was likely to ensue. Left, as we are, to deduce principles from imperfect materials, we are led to conclude, that the ancient painters of Greece never contemplated their art in many points of view, at which the moderns have successfully aimed: but that their prime object was, even in the most cultivated periods, to impress, undisturbed upon the mind, the whole force of one image; and for that purpose apposition, rather than composition, is the most effective mode; especially when aided by a select style of representation. It may, therefore, have been the effect rather of a precise scientific principle, than a want of intelligence, that we find, or conceive we do, an imperfection in the most engaging, though not the most useful parts of the art. It may rationally be doubted, whether, as applied by this polished nation to the worship of imaginary deities, or the exaltation of heroes, it would not have been deprived of a great portion of its influence, if more artifice had been introduced into their pictures; though there is no doubt at all, of the improvement the minor qualities produce in the art, as it is now employed; being an agent of pleasure rather than of instruction or emulation.

We occasionally meet in authors who speak of ancient art, with descriptions of pictures containing many figures, but in general its efforts were confined to subjects in which two or three only were required; and it is worthy of remark, that in none of them is there any observation on the contrasts employed in lines, in light and shade, or in colour: nor is there any mention of what is now understood by the term back-ground. To guess from these attempts at criticism, we should, at least we might conclude, that all pictures painted by the Greeks were similar in principle to those found at Herculaneum, of which the best have entirely plain grounds, and others very little variety; which evidently shews, that the writers were unacquainted with the art. Their remarks are too vague, too undetermined, appear not to flow from any feeling or knowledge of what art is, but only from common perceptions, alike felt by all of equal understanding. Yet every painter knows, that without some ingenious management of the ground, quite sufficient to form an object of particular remark, the land of Alexander would have still adhered to the canvas; and not, as Pliny remarks, have appeared to project before it, or "out of it."

That they discovered to a certain extent the effect of contrasting lights and shades, is evident from Plutarch's observation, that "painters increase the brilliancy of light colours by opposing them to dark ones, or to shades;" and Pliny has this remarkable general expression, when, having spoken of the painters in the monochromatic style, he adds, "in process of time the art assumed new powers, and discovered (or invented) light and shadow; by gradating which, the colours are alternately heightened or kept down. Afterwards *splendour* was added, which was different from light, and which, because it was a mean between light and shade, they called *tonon*; and the union of the colours, and the transition from one to another, they called *barmogen*," lib. xxxv. c. 5. Although we see in these passages, that the three grand requisites for the science of colouring and of chiaro-scuro, *viz.* contrast, tone, and harmony, were felt by the Greeks; that the degrees of light and shade in their own force, and in their approach towards each other, were fully understood; with the value of middle tints, the most difficult and important object of the painter's attention; and that one general hue in the whole work was considered and effected; yet we cannot agree with M. Du Bos and others, that we ought hence to conclude, that chiaro-scuro was

scientifically understood and practised by them to any extent, at all approaching that to which it has subsequently been carried by Rembrandt and the Flemish school, or the best among the Italians. All, which Pliny asserts, they knew upon this head, is requisite for the due execution of a single figure, upon a plain ground, and offered to view in the most simple style of composition. Unhappily very few of their pictures have remained to us, and those we have, we must suppose are the works of inferior artists. Among the twelve pictures, the best of those found at Herculaneum, and all possessed of infinite beauties in taste, in grace, and feeling; there is exhibited in one of them a more compound management of chiaro-scuro, in the reduction of tone on parts of the flesh and drapery, than is to be found in any other monument of ancient art; but it is not sufficient to prove that it proceeded from any thing like principle. We have, therefore, no satisfactory proof upon this subject; and it is most rational to conclude with sir Jos. Reynolds, that this, which makes so material a part of modern art, was unknown to the Greeks (as a science.) "If," he observes, and justly, "the great painters had possessed this excellence, some portion of it would infallibly have been diffused, and have been discovered in the works of inferior artists handed down to us."

The same may be said of their knowledge of perspective, at least of the application they made of it in pictures; notwithstanding Vitruvius says, that it was practised by Agatharchus, a contemporary of Æschylus and Polygnotus, in the theatre at Athens; and was soon afterwards reduced to principles, and treated as a science, by Anaxagoras and Democritus. The reasoning upon this subject stands precisely upon the same ground as that concerning their knowledge of chiaro-scuro, and we are naturally led to the same conclusion; though it is difficult to conceive, that when the general principles of a science so necessary to just delineation were understood, that they should not be put into practice. Perhaps, as we have before observed, it is possible that back-grounds were more simple than we are accustomed to see them in modern times; and therefore less of perspective would be required in them.

It certainly is not a little remarkable, that no mention of consequence, of any thing like a ground of relief, should be made in describing pictures, of whose beauties in the principal parts we have such enthusiastic encomiums; and so little of landscape, that it appears to have been almost entirely disregarded. The attempts at back-ground in two or three of the Herculaneum pictures, are puerile in the extreme; and the most beautiful productions of ancient art yet exhibited to modern times, are of figures relieved off plain grounds, or rather blended into them. If Apelles, or any other great and renowned master, had made it a study, to produce a beautiful combination of objects receding in due degrees to extreme distance, such as in these days is regarded as absolutely necessary in a picture, the scene of whose action is in the open air; it is hardly credible, that it would not so far have attracted the attention of the critic as to have become an object of remark. But in none of the criticisms or observations of ancient authors, (of Pliny more particularly,) is a secondary object ever even mentioned, as being on a separate line of ground, or distance; or indeed any thing, but the immediate subject of the picture; though many of those he describes are such, as to require the accompaniment of natural objects, as sky, rocks, trees, mountains, &c.

In Italy, as well as in Greece, it appears not improbable, that painting was practised at an early period, but in a rude and very imperfect mode: little, however, is known of its actual

PAINING.

actual progress there; and that little, partaking more of antiquarian curiosity, conjecture, and doubt, than of utility, or certainty. Pliny, indeed, says, that there were paintings exhibiting at Ardea in his time, executed before the foundation of Rome. But after a lapse of 800 years, how much of this may not be attributed to error in the tradition he recorded? The earliest traceable and satisfactory account of the art being practised in Rome, is in the year 450 of the city, or 303 years before our era; when Fabius, a noble patrician, painted the temple of Salus; and he and his family thence obtained the surname of *Pictor*. It is not improbable that Fabius had travelled in Greece, and there had the happiness to see the elevated station of the art at that time; he might even have seen Apelles himself, employed upon those works which brought honour upon his country, and secured immortality for himself. Yet the city does not appear to have much profited by this example; nor to have obtained renown for its artists, either in number or in quality. Pliny mentions none other after Fabius, till, on the lapse of 150 years, Pacuvius, the poet, amused his declining years with painting the temple of Hercules in the *Forum Boarium*. Although it is evident, that about this time Greek paintings were introduced into Rome, either to gratify curiosity, or adorn the triumphs of generals who had been engaged in Sicily, or Greece; yet no emulation to cope with the artists of those countries was exhibited by the Romans. That warlike people were too much occupied in schemes of aggrandisement and military fame, to devote much attention to the arts; and it was not till the time of the emperors, that they experienced any thing like encouragement in Italy.

After the reduction of Greece to the Roman power, the city of the conquerors became the emporium of honour, employment, and consequent profit to artists; but that only in a gradual advance. First of all, the plunder of the ancient residence of taste, (that country, where, of all the world, it had alone found a secure and honoured establishment and due regard for a great length of time; where its utility was proved, and its delights enjoyed;) satiated, as well as astonished, the uncultivated, comparatively uncultivated, inhabitants of Italy; and no employment might be found for domestic artists, when the views of all admirers of art, were directed to another country for a supply of their wants. Afterwards the men themselves, who had in vain laboured to continue the arts in that once favoured, but now unhappy country, quitted it, to ensure their own existence; till, by degrees, Rome, become the mistress of the world in policy, assumed the controul of the arts. Still its own native citizens were content to allow themselves an inferior share in its praise; since the principal part of the artists, either in painting or sculpture, who practised in Italy, are supposed to have been Greeks.

Antiquaries, under the influence of varying circumstances, have at different times attached priority of cultivation to different countries. Such is the case with the regions of Italy. Etruria has been, and is still, most generally considered as the nurse of the arts in that country; but the discovery of painted vases in the southern parts of Italy, and in Sicily, being more frequent than in Etruria, has led many to imagine, of late, that painting was practised in those countries previous to its cultivation in the more northern provinces. But very little argument can be derived from this circumstance; as it appears to us, that the designs and execution of those curious monuments of art, only testify the previous existence of some superior powers in the art; as the extension of taste in our own manufactories, or the attempts at it, proves the existence of the art of painting,

and its higher, or more direct cultivation in this country. The paintings upon those vases are, it is true, so inferior, as to the extent of art they exhibit, that they merit only to be classed among the productions of the earliest periods; but that perhaps is more owing to the artists who executed them, being desirous of proceeding only so far as would answer a specific purpose; and by no means aiming to attain the degree of perfection at which the art had actually arrived at the time. The slight degree of difference in point of excellence among the majority of them, affords an argument to prove, that it was not painting, or the cultivation of it, which was the object of those who supplied the initiated with these vases. Some few of them, in invention indeed, indicate a mental power superior to the system upon which they are executed; and the artists who painted them, only appear to have employed, in an imperfect manner, materials offered to their hands by others. For whatever purpose they pursued their labours, it was probably sufficient for them, that the hieroglyphics they marked were understood: that being effected, their object was completed. Some of them being rather more ingenious artificers than others, and guided by the learned or artful, multiplied combinations of figures, in order to create or explain deeper mysteries, and excite the zeal of the superstitious and enthusiastic. If these opinions are correct, there is no arguing concerning the state, or antiquity, of the art of painting from Etruscan vases. The use of their hieroglyphics, for so the figures employed upon them may be termed, like those of the Egyptians, or like letters, admit of little improvement, or indeed of alteration, in themselves; and allow only of being changed in effect, by new combinations. They may, therefore, or they may not, have been executed at a period comparatively late, when considered with regard to the history of painting properly so called; and certainly may be regarded, rather as an offset, than as attached to the main stems in its growth; or as an extraneous application of part of the art, rather than the art itself.

Where the Greeks first settled in Italy, or where the most free communication was held with the mother country, there it is most likely the arts transplanted, would be first cultivated; but they do not appear to have arrived at any great degree of excellence in any part of that country, previous to the conquest of Greece by the Romans; and it must still remain a doubt, whether Etruria or Calabria was the parental abode of the arts of Italy. They appear certainly to have received more cultivation in the former of those districts than in the latter, particularly sculpture; at least, there is something like evidence of the culture of it in Pliny, who mentions, "that the little brazen images, dispersed all over the country, were wrought in Tuscany in very ancient times."

Whencesoever it were that Rome acquired the little taste she felt for art, or rather the slight degree of emulation which animated her citizens to enter the paths of tasteful cultivation, it is certain, that during the period of her existence as a republic, the impetus was very weak, and the progress of course of little or no extent. The practice of painting after the days of Pacuvius, before mentioned, was held to be effeminate and disgraceful; and it was not subsequently engaged in by any respectable men. The result, of course, was a testimony to the wisdom of the Greeks; who, in order to enhance the merit of the art, ordained, that none but such as Roman pride excluded, should presume to practise it. From being regarded as contemptible, it actually became so; whereas in Greece, being raised in rank and esteem, it became truly worthy of both. But what this powerful city could not acquire by her own genius, she endeavoured, after her

PAINING.

her generals became acquainted with the riches of Greece and Sicily, to treasure up from the spoils of those countries. Some of those generals, to increase the splendour of their triumphs, and others, for private or for public ornament, carried pictures as well as statues to Rome, and exhibited them to the people; and others again caused pictures to be painted of their successful battles, to stimulate the admiration and applause of the people; and thus tacitly acknowledging the value of the art, upbraided their fellow citizens, for neglecting the cultivation of it.

It would be natural to suppose that when the fierceness and severity of republican independence gave way to the suavity and more refined manners of a court devoted to one person; when literature and science were highly cultivated, and the example of Greece was before them; that the Romans would not fail to blend the pursuit of the elegant arts, with the refined luxuries in which they indulged. But that does not appear to have been the case, to any great degree. Had it been so, Pliny, who does not easily lose sight of the honour of his country, would not have failed to mention it; particularly as it came so near the time in which he lived. He gives only the names of a few painters then practising, or who had practised, being native artists; and accompanies it with a lamentation, "that the art was dying." Lib. xxxv. cap. 5.

Even in the practice of the Greek painters of that period employed in Italy, the certain mark of decaying art is constantly referred to by contemporary authors; *viz.* brilliancy, rather than purity and truth in colouring; and ornament, adding affected beauty to forms, and taking place of simplicity, elegance, and expression.

As no preparation of art had previously taken place, powerful enough to aid the plans of the state, when Augustus understood the system of the Grecian leaders, and saw the use to be made of painting by a monarch; he very wisely endeavoured to adopt what was ready to his hands; and caused two pictures, painted by Apelles, of Alexander victorious, and triumphant, to be carried to Rome, and placed conspicuously in the forum. Images of his own power and exaltation, which Claudius Cæsar more openly proclaimed, when he ordered the heads of both pictures to be cut out, and Augustus's portrait placed in their stead. But the Romans, and Roman emperors, whatever subjects they may have created for the pencil, found little native talent able, or sufficiently interested, to convey them to posterity in an honourable manner by painting; and even in sculpture their best artists were low indeed in comparison with the Greeks, at least no Roman artists' names of great repute are handed down to us. Both arts were diverted to unworthy objects; they continued to fall in every valuable quality; and painting most of all; till at length the irruptions of the northern nations put an end to both Grecian and Roman efforts; and barbarism, from which Greece is not yet redeemed, usurped the stations of luxury and refinement. For near 1000 years, did the glorious title of the cultivator of intellectual power; the leader among nations, in whatever was most adapted to do honour to human nature, appertain to that highly favoured country; for a period approaching 2000, has she suffered degradation and depression, even almost to annihilation. Yet her present inhabitants are represented by travellers as still the same animated and ardent race, although bending to the strong hand of power, and unhappily under the influence of a government and religion, whose tenets forbid the extension of human knowledge; and whose power is upheld by ignorance.

Italy, overcome by the same wild anarchy with Greece,

groaned not under the weight of the despotic spoiler who had subdued her energies, more than half the time which her predecessor in the race of nations has bowed, ere the dawns of science beamed upon her, and roused her from the state of torpor to which she had been reduced.

Even then, Greeks had the honour of stimulating her to the cultivation of her native powers; till at length that flame was kindled, which, by a gradual accumulation of strength, warmed Italian breasts, and excited them to emulate in arts, those whom their forefathers had subdued in arms. But the country being then under the controul of a system of religion which forbade the introduction of images into her temples, the course and application of study was necessarily changed, and the art of painting became the principal object of attention; whereas that art, highly as it was prized and cultivated by the Grecians, in the latter periods of their existence as a ruling power, had remained, as we have seen, for a great length of time, nearly unemployed; whilst the sister art of sculpture, being most subservient to the purposes of an idolatrous religion, was cultivated in so extraordinary a manner, that the accumulation of its productions in statues, bas-reliefs, &c. both in bronze and marble, became prodigious; and not to be imagined by those unacquainted with the fact. Pausanias speaks of 2827 entire statues in the places which he travelled through, as remaining in his time, besides numerous other works of sculpture; and this was only in a part of Greece, and not till after the Romans had, for 300 years, been plundering the country of innumerable beautiful productions. Rhodes, it is said, could boast of 3000 statues of brass; and Nero took, from Delphos alone, 500 statues. The cause of this vast accumulation of sculpture is apparent; in the patronage that art derived from the government and the priesthood; who found it an useful instrument in moulding the people to their wishes. They were well acquainted with its influence upon the minds of men, when skilfully applied in exciting their sympathies, stimulating their emulation, or assisting in compelling their devotion. The foundation, therefore, of the superexcellence of this art among the Greeks, does not lie very deep for our research. What else could be the result of so much, and so constant an employment for a connected series of hundreds of years, the consequent emulation which must ensue, where so many competitors entered the field, and when, in addition to the influence of government, so many establishments of a religious order were anxious to become conspicuous by employing them? By its means the priesthood were enriched, and exalted in the eyes of their countrymen; adorers were drawn to their shrines; and their favourite divinities more generally worshipped.

The same sentiments and principles, always present to the ambitious and powerful, and which, under happy auspices, re-act for the benefit of the people, operated near 1000 years afterwards upon the government and church of Rome; when, by the revival of science and of art, these salutary means of strengthening themselves fell into their hands. But, as the second commandment of the decalogue by which they were, or rather ought to have been, controuled, prohibited the worship of images; their attention was directed to the use which might be made of painting, and sculpture was confined to monumental and ornamental purposes; or nearly so. Thus circumstanced, the result was precisely the reverse of what occurred in Greece. Sculpture, except in a few instances, made a progress only to mediocrity; whilst painting rose and expanded its beauties to the utmost perfection; and soon followed that period, when, as we have before observed, notwithstanding the high-flown panegyrics of ancient authors upon Grecian art, the

doubt

PAINING.

doubt is justified, whether its painters were not surpassed by those of Italy and Flanders, who flourished in this latter age of the world.

It was not at once, and by miracle, that painting re-appeared. Cherished, amidst the terrors of war and bigotry, by the Greek monks, in their silent seclusions, it was occasionally exhibited; and for two centuries at least before the acknowledged era of its rise, according to Malvasia, and perhaps more early, had been publicly practised, though humbly, in fresco, and in mosaic. He says that from 1115 to 1140, Guido, Ventura, and Orfon, were employed as painters in several churches at Bologna; and doubtless these practices prevailed in other places; for now the ecclesiastical power of the church of Rome was completely established in Italy, and felt the advantages to be derived from adding splendour to the buildings erected to its honour, and exciting the zeal of its devotees. The character, however, of the art, as exhibited in the works of the Greek agents universally employed at this time, was but ill calculated to answer the higher views of those who promoted the exercise of it; for it was now at its lowest ebb.

Pisa, Lucca, Florence, and other petty republics into which the kingdom of Italy was divided, began, about this period, to shake off the barbarism which had so long abused and controuled them, and to exhibit a taste for improvement. Artists were summoned from Greece to assist in adorning Pisa and Florence; and amongst other things to paint the chapel of the Gondi family, at the church of Sta. Maria Novella, in the latter place; whilst the Venetians employed Apollonius and others of the same country, on mosaics, in the church of St. Mark.

To the gratification enjoyed by Giovanni Cimabue at seeing the productions of the former of these artists, is Europe indebted, in a great measure, for whatever she has since beheld in the art. He, Andrea Taffi, who learned the art of working in mosaic from Apollonius; and Nicolo Pifano, instructed first in sculpture by Greeks, and afterwards by study from ancient bas reliefs, brought by his countryman from Greece; were the first Italians reported to have entered the lists with their masters: whose taste is allowed to have been hard and poor, and devoid of all spirit of imitation; either of nature or of ancient art. A state of debasement we might deem impossible to have occurred, after the extraordinary display of talents which those countries had witnessed; did we not know the rapidity with which the arts fall into decay, if not upheld by a constant succession of practice; and how slow their growth is in advance. And yet, doubtless, notwithstanding the horrors of destructive war, and the mad superstitious zeal of the Iconoclastes of the 8th century, many noble examples of sculpture, and architecture more particularly, must have remained to guide their taste. So it was, however, and Vafari and others speak of the arts at this period, as being utterly unworthy of the name. Such was their situation in Italy, when Cimabue, who was born at Florence, of a noble family, in 1240, having been initiated into the miserable practice of the Greek artists, conceived the desire of improving upon it; and succeeded so well in his attempt, that a picture of the Virgin, which he painted as large as life, for the church dedicated to her at Florence, excited enthusiastic delight in his fellow citizens. They treated the painter with almost divine honours; the picture was carried in procession, with the sound of trumpet, to the place of its destination; and the day was celebrated as a public feast.

Encouraged by this applause and admiration, Cimabue pursued the art with ardour; and though the utmost of his efforts were weak and inefficient, yet he made a very great

advance beyond his teachers. Vafari, 200 years afterwards, could not help expressing his surprize, that he had seen his way so far through the obscurity of the age he lived in: yet such was the Gothic barbarity in his picture of Christ crucified, in the cloister of St. Francis, at Pisa, that written labels are employed to convey the sentiments of the Saviour to his mother and St. John.

His pupil Giotto, whom from a shepherd he raised to be a painter, relieved the art infinitely more from the fetters of Greek imperfection. The extreme rapidity with which he advanced in design, we can only account for by supposing, that he left the trammels of the art, as then practised; and studied attentively the productions of the ancients which were to be found in Florence: and which then, doubtless, began to be in research. Giotto left off the use of labels; aimed at real expression, and obtained it; and, even in his own age, was acknowledged to be the pupil of nature. He may be said to have performed for the Italians what Polygnotus had done for the Grecians, by marking the line in which the art ought to be pursued; and though in both it was accompanied with great deficiencies, yet it was just in its object and direction.

To Giotto the world was indebted for the portraits of Dante, Brunetti, and others, amongst those who at that time shone conspicuous in literature, and with whom he lived upon terms of intimacy and friendship. His abilities procured him the patronage of pope Benedict IX., according to Vafari, (though Baldinucci says he is mistaken, and that it was Boniface VIII.), who employed him in St. Peter's; and highly honoured and remunerated him. Henceforth the art of painting became attached to the papal dignity, and few succeeding pontiffs disregarded the use of it.

An inclination to encourage the practice of painting in all the countries attached to, or dependent upon, the church, at this time became apparent; and the fame of Giotto having spread very widely, the advantage attending the exhibition of his powers was extended to numerous places where he was called to employ them. The king of Naples required him for a time of the pope; received him with honours, and employed him largely. At Avignon, where he attended the pope, at Milan, Lucca, Arezzo, and many other places, besides his own native city, Florence, was he engaged to adorn the churches, &c. with his paintings; and his great work at Assisi remains, though in a ruined state, to this day. (See the article GIOTTO.) The principal benefit the art gained by him was his having again returned to nature for the actions and expressions of his figures; and been very successful in attempting to imitate her effects.

The skill of this ingenious artist excited the emulation of many among his contemporaries throughout Italy; and the arts having now acquired an earnest of employment and reputation, of emolument and of honour, no longer wanted skilful professors, or illustrious patrons. A grand epoch of their establishment took place at Florence in 1350, fourteen years after the death of Giotto; when a disciple of his, Jacopo Cassentino, and nine other artists, founded the academy of St. Luke in that city: an institution from whence arose a large display of talent, increasing in worth, till at length, near 150 years after its foundation, it gave to the world three of the greatest luminaries in art which it has ever known; Lionardo da Vinci, Michael Angelo Bonarotti, and Raphael; besides Masaccio, and others of great repute.

About the same time, considerable advance was made in painting at Venice and Bologna. In the latter place, Franco Bolognese had practised, with great reputation, as a miniator or illuminator of books. He enjoyed with Giotto the friendship of Dante; and the language which that poet employed

employed in praise of their talents, is at once an argument and proof, how little reliance is to be placed upon the praises which authors so freely bestow upon the works of contemporary painters. For though in their time they well merited the rank he gives them, of being at the utmost height in the practice of art; yet we now know for certain, that they were very far indeed from having reached the extent of its possible career; and instead of being found to have offered a perfect sacrifice at the altar of taste, they had scarcely passed the threshold of her temple.

What they had done, however, was of sufficient excellence to operate powerfully in the establishment of the art, particularly by Giotto. But, unhappily, the taste of the time and of the country, was not in favour of that kind of study, by which the Greeks had obtained their exalted rank. The efforts of the art were confined, almost exclusively, to subjects drawn from the history of Christianity; or more frequently, from the legends of saints, and the sufferings of martyrs. The latter, indeed, required some knowledge of anatomy and form; but those drawn from the former sources, however engaging they might be to the heart, presented a field of exercise to the artist, comparatively narrow and confined, when placed in competition with the variety afforded from the wide irregularities of heathenism. Not that the history of the bible fails in presenting to the pencil scenes engaging and poetic, of the highest moral culture, and of sublime imagery; and not less delightful by their simplicity, than interesting and important in their consequences: but there is an alloy attached to them, which renders them not so engaging in vision, as in description; and, therefore, less fit subjects for the painter, than the poet. In the scenes of the New Testament, more particularly; the almost entire exclusion of the nude, or, when introduced, its being devoted to the exhibition of deformity or common life, confining the exertions of the artist to heads and draperies alone; would operate strongly to delay the progress of the art towards its legitimate object, when exclusively employed. And the general feelings of a superstitious age, but just emerging from barbarism, and under subjugation to a priesthood bigoted in the extreme; by no means gave room for that latitude of exertion, without which it is in vain to look for very high attainments. In such a period, whatever tended to make the pleasures of the world inviting, and to render man happy and contented with himself; counteracted the principles of those who hoped, by exciting his apprehensions, to keep him in subjection. Terror, therefore, the most powerful agent of superstition, was more employed than the sentiments of humanity, as the guide of those who selected subjects for the painters; to whom they offered scenes of martyrdom, of infernal punishments, or of hardships and severities to which devotees submitted themselves, in their mistaken zeal for purity and truth. We cannot wonder, therefore, if, under such trammels, the art languished in its progress; and if the ill direction given to the great employment it enjoyed, for a while withheld it from that perfection, to which, under more free indulgence, it aspired; when civil policy united her influence to that of religion, or rather of superstition, in its support.

After a lapse of near 100 years from the death of Giotto, Tomaso da San Giovanni, better known by the name of Masaccio, (from his total neglect of personal appearance,) exhibited a more exalted taste, and a grander style of execution than his contemporaries. The art under his hands may be said to have advanced from the weakness of infancy to the station of youth, verging towards the vigour of perfect manhood. He first composed with an eye to the whole; managed his groups and single figures upon the principles

of perspective, which had been taught him by the sculptor Brunelleschi; and by understanding the effect of those principles, first laid the feet of upright figures flat upon the ground, and foreshortened his heads and figures with truth and effect. In fact, it was to him future artists were indebted for a more sure and full direction of the line in which the art ought to be pursued. He studied nature with the greatest attention, gave breadth and simplicity to his draperies; and most admirable action, character, and expression to his figures; which are justly and appropriately employed, and wrought with admirable execution. Even Raphael did not scruple, 80 years afterwards, to study, and sometimes to adopt his actions; of which there is an extraordinary instance, in the figure of St. Paul preaching at Athens. Michael Angelo is also reported by Vasari, to have regarded his pictures with great respect and attention. His principal works in the chapel of the Brancacci, in the church del Carmine, at Florence, became the school of study for all those excellent artists who succeeded him; till at length Lionardo da Vinci, born near that city in 1445, two years after the death of Masaccio, came forth with superior lustre, and eclipsed all that had preceded. Endowed with uncommon genius, all arts and sciences seemed scarcely to offer a sufficient field for the exertion of his talents. He grasped at all, and succeeded in whatever he undertook; but by his versatility, wasted much of his time in experiment. Had he persevered with steadiness in pursuit of the art of painting, he probably would have carried it to the utmost perfection. As it was, whatever he painted came from his hand elevated and adorned, and presented a complete originality of effect and manner. To truth and precision of character, and whatever had been well done by Masaccio, Lionardo added new and most valuable qualities, by introducing the principles of chiaro-scuro, and depth of tone in colour. By the former of these, pictures were relieved from the tameness of mere imitation; and acquired an increase of power, in boldness and strength of relief, and force of effect. (See EFFECT.) He may be said to have given more than hints of improvement in all the various branches of the art; and to have left some examples, whence, others enjoying more steadiness, and less impetuosity of character, subsequently imbibed such instruction, as directed their course, and aided them in a nearer view of ideal perfection. Michael Angelo in design, Correggio in finish and chiaro-scuro, and Rubens in composition, are fully indebted to Da Vinci for the foundation of much of their perfections.

Before the time of this extraordinary man, the imitative arts had obtained a firm establishment in Italy, by the encouragement its professors enjoyed; and of course the number of artists increased very considerably. One circumstance which occurred at Florence in the year 1400, exhibits that growth very strikingly; and no less so, the true feeling of the citizens of that place towards it. It was the wish of the council, who formed the government, to have another door of bronze to the church of St. John, similar to the one already wrought by Pisano, from a design by Giotto; and for that purpose they invited artists, in various parts of Italy, to send models for competition. The works of seven were chosen for submission to the judges; who consisted, not of a committee of taste appointed from amongst men unpractised in art, but of thirty-four artists of distinguished talent; painters, sculptors, and chasers in gold and silver. Among the competitors, were Brunelleschi, Donatello, and Ghiberti; all men of extraordinary powers, and each worthy of the task. The election fell on Ghiberti, who so executed the work, that Michael Angelo, many years afterwards, said, the doors he had made were worthy to be the gates of heaven. And the

judgment of artists was thus itself justified; and by Vasari is declared to have been regarded, as manifesting not only soundness of sense, but also freedom from every unworthy feeling.

When such care was taken to select in sculpture, it is not probable that the art more immediately applicable to the purposes of the church, which participated in the governments, or rather controuled the sentiments of the whole community, should be neglected in cultivation, or studied vaguely. Accordingly we find, that painting advanced in rapid progress; and circumstances now combined, to render that advance just in its course. The general increase of mental civilization, of literature, and of science; the same causes which operated in the establishment of the first grand era of the arts among the Greeks; now again began to prevail in the world; and the country where they were found, by natural progress, in its turn became the nurse of art; and in time was remunerated in the honour and renown of supporting them, till they established a second epoch, scarcely less illustrious than the former.

The existence of Lionardo da Vinci was the immediate precursor of that exaltation; and the examples he left, and the lessons he inculcated in his writings, had no small share in producing it. (See VINCI DA.) In him, as we have seen in Pamphilus, the master of Apelles, the art enjoyed the advantage of an union with science and general cultivation; and the effect of that combination is evident in the history of both. It enabled Lionardo to embellish and diversify the general impression of character drawn by Masaccio; and to exhibit, with more variety and fullness, the latent feelings of the human heart. Of this, his picture of the last supper, at Milan, is a sufficient proof. And that this perfection was the result of deep reflection, is evident, by his having refrained from painting the head of the Saviour, till he could completely satisfy his mind, with what features and expression he ought to compose a representation of his divine character. By him the theory of design was perfected to a considerable degree. His book upon its principles is well known, and though confused, ill digested, and unequal in its parts; yet it is, beyond a doubt, the most scientific and useful, of all elementary books on the subject; and will alone testify the extraordinary power of his mind, and his activity in research. Many others of his writings are unfortunately lost; and some confined to libraries, where they are very rarely visible.

About the beginning of the century in which Lionardo was born, the use of oil was adopted as a vehicle for painting; and afforded the means of most extensive improvement; particularly in colour and effect. Distemper, or colours mixed with size and water, &c. appears to have been the first adopted practice; and afterwards, fresco; as more durable and better adapted to larger purposes. (See DISTEMPER and FRESCO.) But both of these modes are limited in the execution, more particularly the latter, in which no means being given to change or retouch the colours without evident disparagement of the work, the artist was obliged to adopt as simple a plan of conduct as possible in the management of his designs. But when a vehicle was discovered, or applied, the use of which permitted frequent changes in effect, and in arrangement of colours, with the assurance of perfect union at the conclusion; no means were wanting which he could desire for the indulgence of the utmost stretch of his imagination.

The event which gave rise to the exercise of painting with colours ground and mixed with oil, is supposed, with great reason, to have been varnishing over pictures painted with water colours: which, as they were wrought up to the full re-

semblance of natural objects when the colours were dry, were rendered by the varnish as deep in hue as when the materials were wetted to be employed; and thus a tone of effect was superadded to the natural and ordinary one, purely artificial, but very engaging; and the more so, when placed in opposition to the comparatively dull and tame effect of the former modes; which of necessity lacked lustre, as they always dried with a deadened surface.

The discovery of this very essential advantage to the art of painting, which so readily enabled it to outstep whatever had been previously done; has been, by most authors who have written upon the subject, attributed to John Van Eyck, of Brussels, in 1410. Though many doubt concerning the accuracy of this opinion, yet one thing remains clear, that till after the time in which he lived, oil, as a vehicle for colour, was not in general use. No doubt can remain, that if he did not actually first apply it to the purpose of his art, at least he first used it essentially and effectually. His application of it would not otherwise have made, as Vanmader says, "as much noise in the world as the discovery of gunpowder by Bertoldo Schwartz had done, near a century before!" nor would a native of Italy have taken the trouble of journeying to Flanders, and soliciting the friendship and instructions of Van Eyck, as, Vasari says, Antonello da Messina did, could he have obtained the knowledge he sought at the cost of less trouble and time.

Painting, according to Vanmader, the historian of the Flemish artists, had been carried into Flanders about the time of Giotto, by some Flemings who went for the express purpose of learning it; and he says that "the mode of painting brought from Italy was with gum and eggs; having been so practised at Florence, at its first commencement by Cimabue." It spread in practice among the Germans about the same time, and each of these countries established a mode of art, or style, for themselves. It was in Italy alone, however, that any true perception of what was the proper object of art appears to have been felt, and there it was first exhibited; and even there, it dates its principal exertions from one city and its dependencies, *viz.* Florence. In this place alone it remained pure in its object, the delineation of character and expression, with selection of form, and simplicity, and unmixed purity of effect. A style of design, which pursuing the first impulse of the art, *viz.* the representation of events at their most impressive moments, leaves minor objects out of consideration; and aims solely at fulfilling its purposes in an intuitive manner, upon the mind of an observer. That style, Giotto had founded; it was improved in effect by Masaccio, strengthened by Bartolomeo della Porta, and Lionardo da Vinci, and finally perfected by Raphael and Michael Angelo.

To this most important aim of the art, the introduction of oil in painting brought no efficient aid. What has been said of its benefits, applies only to the ornamental, or less important applications of it. The objects of the grand style, *viz.* beauty of design, and purity of expression, the weakest materials are capable of presenting to the imagination; and, therefore, notwithstanding the brilliancy of colour and effect, which was afforded by the use of oil, it was in great measure disregarded by the Florentines; or if employed by them, they carried into its practice, the defective hues of fresco: to the exception of Lionardo da Vinci, and Fra. Bartolomeo della Porta, (born at Florence in 1479,) who followed closely the line of colouring laid down by the former, his immediate predecessor. To him, the art is indebted for the first conception of the union of true grandeur of style in design, with a suitable dignity and depth of colouring. The subjects he chose were generally of a religious kind, which nearly ex-

cluded naked figures; but he amply compensated for that, by the mode in which he composed his draperies, and arranged his groups. Of him Raphael is supposed to have acquired more information than from any other source, till he had seen the works of M. Angelo in the Sistine chapel. It was Bartolomeo who changed the taste he had imbibed from his master Pietro Perugino, and directed it in the course wherein he afterwards surpassed all that the modern art of painting had effected.

This delightful art, supported by an illustrious patronage, derived, from its acknowledged ability to aid the purposes of state, the increase of riches and of intellectual cultivation; but most materially from religion, now attained its second era of glorious success. A constellation of ingenious men, endowed with uncommon talents, appeared to spread its light once more through the world; and painting was perfected, as far perhaps as human nature can carry it, in the works of Michael Angelo, Raphael, Titian, and Correggio.

Although no one of these four great men appear to have made the Grecian principle of select beauty a precise object of attention; yet in those branches of the art which they more immediately cultivated, they must be considered as having attained the very highest rank. The almost miraculous sublimity of invention, grandeur of design, and breadth of manner, with which the series of pictures adorning the chapel of Sixtus IV. in the Vatican, are planned and executed; sufficiently attest the power of the former. The truth, simplicity, grace, and propriety, exhibited in the historic and poetic compositions, which cover the walls of the pontifical palace itself, and which are also exhibited in the cartoons at Hampton Court; justify the praise bestowed on Raphael. The renown of Titian would be supported by the grandeur of conception, richness and truth of colour, and vigour of effect, which characterises his St. Peter Martyr, did no other work of his masterly hand exist. And Correggio will ever live in estimation, while the suavity and grace of arrangement, the perfect harmony of colour, and the concentrated and brilliant effects of chiaro-scuro, exhibited in the Duomo of Parma, the Notte at Dresden, and the St. Jerome at Paris, are preserved to the world. (See lives of M. Angelo, Titian, Raphael, and Correggio.) To behold the various excellencies of these great men united in one, is still "a consummation devoutly to be wished."

At the time in which they flourished, namely, about the end of the fifteenth and beginning of the sixteenth century, the immense patronage which the art was enjoying throughout Italy, stimulated numbers to the profession of it. In Rome, Naples, Florence, Bologna, Parma, Venice, Lucca, &c. abundance of artists were found ready to fulfil the commissions which individuals, convents, and churches, heaped upon them.

Whilst it was pursued at Florence in its higher principles, and thence transplanted pure to Rome, to adorn the pontifical palaces, &c. of the imperial city; its more alluring, though less solid charms, were cultivated at Venice; where colour occupied the attention of the artists, and repaid it with her most engaging fascinations. Among those artists, Giorgione del Castell Franco, born in 1477, has the reputation of having begun that system of colouring, which his early death alone prevented him from carrying to perfection. Had the period of his existence been lengthened, it is probable that Titian, who adopted his style, would not have stood so completely alone, as he now does, at the head of the Venetian school. In character, and in grace, Giorgione, in some of the few works which he has left, has evidently

surpassed him. Except in the adaptations of it to exalted subjects, and an admixture of a certain degree of grandeur and purity in design, which was effected by Titian, the Venetian style of art has an equal supporter in Giacomo Robusti, called il Tintoretto; who too free to be correct, and too daring to be chaste, held the pencil with a vigour of colour and execution, worthy of being added to the sublimity of Michael Angelo in design. Unfortunately, to the delights of execution and surface, he sacrificed character, expression, and propriety; and the world ought to regard him as the founder of the ornamental style, rather than Titian; whose best works hold a middle rank between Tintoretto and Michael Angelo, and are of too serious a character to merit that appellation. It was, however, his process of colouring, which guided the hand of Tintoretto, and also that of Paulo Veronese, in establishing the success of the Venetian school. Paduanino, the elder and younger Palma, Pordenone, the Bassans, and many others, upheld the system for a time, but not with equal powers.

Another aberration from the grander aim, and more solid original principles of the art, was effected at Parma by the talents of Correggio. Whether he had ever seen the works of Leonardo da Vinci, must remain a doubt. Certainly, the same feeling of arrangement in light and shade, and in the tones, or approaching tones, of colour, seems to have governed both; but Correggio first exhibited it in large works, with brilliancy, with richness, and with consummate harmony. To his principal object, grace of effect, he sacrificed forms and characters; but made amends for the treason, by the perfection to which he carried his own principles. Yet the peculiar grace which accompanied his designs, was too frequently of an artificial nature, and dangerous to follow; as it approaches the verge of affectation, and sometimes justly deserved that appellation.

That peculiar practice of the art, of which Correggio was the inventor, acquired from the district wherein he and his imitators resided, the title of the Lombard style; having chiaro-scuro, rather than colour, for its basis. So that we find the three great schools, into which the Italian practice of painting has been divided, were founded separately upon the three great principles of the art. The Florentine, upon design; the Venetian, upon colour; and the Lombard, upon the union of colour and chiaro-scuro, but principally upon the latter. The colouring of the Lombard school differs from that of the Venetian, in being less positive, or less prismatic; and more like the reduced effect of colours seen by twilight; their hues being rendered subservient to the principle which more immediately characterises that school. Whereas, in the Venetian style, the colours themselves form a part of the chiaro-scuro, and are wrought up to the highest degree of purity and brilliancy of which they are capable. The styles of both are completely artificial; and the result of science, deviating from the general appearances of nature; and are in great danger of becoming unnatural, except in the most skilful hands.

There are, indeed, two other schools spoken of in Italy, viz. the Roman and the Bolognese. But we can hardly separate the former from the Florentine; for the principal works done at Rome were by Florentines, or those educated amongst them, who of course brought the style of that school with them to Rome, and executed their pictures in it; and that of the Bolognese, being an attempt at combining the excellencies of the three principal ones, cannot be classed with those original styles; founded as they are on original principles of art. The Carracci, nearly 100 years after the time of Raphael, were the principal promoters of

this system of combination; which in no slight degree assisted in the ruin of the art, by distracting the attention of its professors. Agostino Carracci wrote a sonnet upon it, in which he inculcated his own ideas, of the qualities necessary to form a perfect painter; wherein he says, "whoever would be a great painter, must take the design of Rome; the shade and motion of Venice; the dignified tone of Lombardy's colour; the terrible manner of Michael Angelo; the just symmetry of Raphael; Titiano's truth of nature; and the sovereign purity of Correggio's style: add to these, the decorum and solidity of Tibaldi; the learned invention of Primaticcio; and a little of Parmigiano's grace." However laudable the attempt to unite these various excellencies may be, the difficulty has hitherto been found too great for any one successfully to combat; and the labours of its great founders, even of Annibal and Ludovico Carracci, powerful and able as they were, by no means served to prove the certainty of the system, in conducting the practice of art to perfection. Notwithstanding the plausible theory it held out, it was too vague in principle, and admitted of too much uncertainty and variety in practice; as each one who adopted it, was at liberty to take, or reject, as much of the peculiar qualities of the masters recommended, as his own taste might direct.

The exercise of painting, as pursued by the Florentine school, being founded upon the most original, most simple, and most valuable principle of the art, is, no doubt, most worthy of esteem. Its grand object, at its happiest period, was an undisguised address to the understanding; and its means, were grandeur of style and truth in design, and a simple unaffected colouring. In its practice there was an uniformity of pursuit, and the same ideas which governed and directed the attention of the earlier artists, were emulously and steadily cultivated; till at length, after a lapse of more than 300 years, from the time of Cimabue, if he may be called the founder, its triumph was completed by the talents of Michael Angelo Buonarrotti, who has been styled the Homer of modern painting. Raphael, however, must not be deprived of the share of applause due to him in tracing the line of its success; for though he was not strictly Florentine, yet the better part of his means were drawn from that school, whose principles he adopted as soon as he was acquainted with them. The praise, however, which is his due, does not arise from any extension of improvement upon the principles of the Florentine school, but from a more perfect application of them than had before been known. He therefore, in this respect, stands upon much lower ground than his great contemporary, who increased considerably the importance of its aims, and grandeur of the style in which they were displayed; and after whose death it gradually declined, till it was at length overpowered by the more specious attractions of the two other schools we have mentioned, the Venetian and the Lombard. In this elevation of the Florentine school, we would not be thought to fail in due respect for the others; from whence have proceeded so many men of great abilities, and so many works of superior excellence. The combination of the three, forms a mass of excellence, the productions of which, the world yet beholds with wonder and delight: but of which, the eclectic principle of the Bolognese school has failed to exhibit one highly effective instance. For further illustration of the peculiar varieties of these schools, see the articles COLOURING and COMPOSITION, most of the principal ones concerning the different parts of painting, and the lives of the painters most conspicuous in them.

At the time when the great masters of these schools were assiduously cultivating the art, and almost simultaneously

bringing it to perfection in all its various branches; it fortunately occurred, that there existed men possessed of affluence and power, conscious of its value, and sensible to its beauties; willing to aid the exertions of its professors, and to employ their talents in an exalted manner. Long held benumbed by the rigid severities of neglect, the germ of its growth, at first, had scarcely felt the genial warmth of encouragement applied to it; by degrees it slowly spread forth its leaves to catch the inspiring gale; then eagerly enjoyed the kind atmosphere which surrounded it; at length its beauties burst suddenly on the view with delightful perfection, and by the enchanting pleasure it afforded, more than repaid the hands which had cherished it. Even in its decay, it left a blessed odour upon the countries that had fostered it: a memento of their existence in the great scale of nations, far more estimable, than the melancholy details of artifice, (under the name of policy,) and of war with its attendant miseries, which so perpetually blacken the page of history.

If the circumstances which attended its progress in ancient Greece, be compared with those accompanying its more recent one in Italy, of which we now speak, they will be found most singularly to correspond; even to the periods of time occupied in its several stages. In both countries, it had risen under the influence of devotional feeling, to various degrees of improvement, as possessed by different masters. It had been enlarged, enlightened, and rendered more estimable by the elements of learning and science infused into its studies; in Greece by Pamphilus, and in Italy by Lionardo da Vinci; and during the latter periods of its progressive improvement, it was employed in both countries as an agent of state policy.

The patronage which we have seen the art enjoying in Italy from the commencement of its career, kept pace with its progress, till it was perfected by the family of the Medici at Florence, and by Julius II. and Leo X. at Rome. Cosmo di Medici in his superintendance over the political affairs of the former place, during the first part of the fifteenth century, did not neglect the interests of its academy, and of the arts in general. A great mass of reliques of ancient art, recovered from oblivion by industrious research throughout the country, of which they had once been the most conspicuous ornaments, adorned his magnificent mansion in that city. These he exhibited for the improvement of taste, and took under his peculiar care the academy of St. Luke, which had been formed in the preceding century. His grandson, Lorenzo, surnamed the Magnificent, who in 1464 succeeded to his power and influence, and was endowed with a far greater predilection for art, for science, and for literary pursuits; increased the collection in a very considerable degree. Being laudably desirous of exciting his countrymen to a successful rivalry with these treasures of beauty, or rather of encouraging the spirit and ability already exhibited by them, he opened his gardens where they were deposited as a school of study; and honouring the abilities of Michael Angelo, appointed him to the management of it. By his influence, and that of Piero Soderini, then Gonfaloniere, the council hall of the republic, which had been recently rebuilt, was ordered to be adorned with paintings by Lionardo da Vinci and Michael Angelo; each having one side of the hall appointed for the exertion of his abilities. This was the first example of any consequence, of public civil employment being given to the painters of Italy; for hitherto their greater exertions had been confined to religious subjects, and devoted to the service and benefit of religious establishments. The subjects chosen for these great competitors were of an heroic nature; and selected from the history of

of the wars of the republic. Unfortunately neither of them proceeded so far as to complete their pictures, although their preparatory cartoons were the theme of universal approbation; and whilst they were preserved, succeeding artists rushed with eagerness to study their excellencies.

The political disturbances which took place soon after prevented the further attention of the Florentines to the arts for some time. In the mean while that skilful, great, and ambitious successor to the papal chair, Julius II., informed of the high perfection in which painting was then practised, would not allow so useful an instrument to lie unemployed in his service. He summoned both Angelo and Raphael to attend him; and under his auspices those great works were begun in the Vatican, of which we have before spoken. His successor, Leo X., emulating the magnificence of his father, Lorenzo di Medici, and that of his immediate predecessor in the papal chair, continued to perfect the plans which the latter had laid down; and directed the efforts of the pencil, to the honour and service of the church over which he presided, the station which he more immediately held, and his own peculiar glory.

The recent discoveries of some of the most beautiful antique statues with which we are acquainted, and which were brought by the popes to assist in adorning the pontifical palace; together with the splendid and admirable works produced by the two great artists and others of lesser note; completely transferred the seat of the arts from Florence to that imperial residence of power, which had hitherto acted but a secondary part, or hardly that, in their cultivation. To this alluring mass of talent, the powers of Titian were also ultimately added; and so important and instructive an assemblage of excellencies was thus combined, that Rome became a kind of university of art, and the resort of all those who aspired at eminence in the practice of it; and more particularly in its most exalted qualities. Thus the second grand epoch of the art was completed in the age of Leo X.

It might have been expected that the effects of these brilliant examples of art would produce still greater excellencies; but, as if there were a boundary set to the intellectual exertions of man, beyond which he is not permitted to pass; the patronage of the highest powers, and the ardent ambition of ingenious artists failed, even to prolong these days of super-eminent success. The splendour of the talents exhibited by those great luminaries of the art, seem to have dazzled, whilst it illuminated, those who approached the hemisphere wherein it shone; and all attempts to reach its exaltation were in vain. After this favoured period, in which it appears that both patrons and artists, had arrived at the ultimatum of their greatness, the hand of destiny once more conducted the art of painting to its decline in Italy. Yet, as before, it lingered in its fall; and like a meteor approaching to dissolution, cast many brilliant emanations around.

Among the most skilful of those who continued to uphold the practice of art with ability, were Julio Romano, Francesco Parmigiano, Pellegrino Tibaldi, and Tintoretto. The former was the most successful of the pupils of Raphael; but though, like Raphael, struck with the grand aims and style of Michael Angelo, he had not his judgment and taste to guide him in the application of it. Endowed with a poetic imagination, and desirous of being original, he swerved from the course pointed out by his master, and lost sight of his purity and truth. Yet if there ever were one painter in the world, whose taste, whose feeling, and whose style, might be adopted with impunity, and imitated without apprehension of imbecility, it certainly was Raphael. Founded as it was upon nature, his taste in composition seems

to bid defiance to perversion. His invention was subservient to his subject, and was dictated by it; and yet, in his successors it not unfrequently took the lead; and the subject, gave way to the bewitching delights of contrast, grouping, and all the systematic arrangements of the art. The grandeur of style, and imposing power of Michael Angelo, was the misused source of this destroying evil. That style, emanating from a peculiar sympathetic feeling of his exalted mind, and correspondent to the poetic fervour which inspired it, though strong and boldly marked, was still under the guidance of nature; and by his perfect knowledge of her forms, was prevented from swerving to deformity. After him, men unable to fathom his principles of action, did not scruple to tread on the ground which he had hallowed; Pellegrino Tibaldi alone traced his steps with successful energy; and displayed his power in the frescoes which adorn the hall of the Institute at Bologna. But in the hands of most of his imitators, it became only a specious mode of imposing upon the unlearned; and contortion and grimace, under the appellation of *il Gusto Grande*, took place of style and character.

The principle of the Venetian style, being more loosely founded than those of the former two, and capable of application to all kinds of subjects, though not with equal propriety, was of course less likely to be so soon destroyed; and having the natural charm of colour for its support, it was practised with considerable success for a length of time. But that of Correggio being altogether imaginary, or arising from more abstract research, found no successful imitator. His expansive breadth of light, conducted with fullness of colour, perfect harmony, and depth of tone, has certainly never been repeated by any one, or but partially. Parmigiano, who probably saw him paint, and doubtless studied his works with great attention, imbibed more of his peculiar excellencies than any other; and in his best works adopted as much of the tone and style of Correggio, as he could blend with his more exalted attempts to reach the lofty design of Michael Angelo. One work, such as his picture of the vision of St. Jerome, now in England, makes more than ample amends for his mistaken adoption of the grace of Correggio; and its too frequent perversion to affectation, visible in his smaller designs. He, unfortunately, like Giorgione, was cut off in the early part of his career, (at the age of 37,) and perhaps before the fullness of his power had time, or opportunity, completely to develop itself. Had he been longer spared to the world, and his progress been equal to the promise afforded by the works he has left; it is more than probable, that we should have seen a more perfect combination of the superior excellencies of the art, than has hitherto been effected. See PARMIGIANO.

About the end of the 16th century, the Eclectic school of Bologna, of which we have before spoken, was founded under the auspices of the Carracci; and certainly, though they did not effectually complete the object they proposed, yet their exertions and abilities arrested, for a while, the retrograde progress of the art. Ludovico the senior, and teacher of the others, in a great measure restored the art once more to nature; and by the purity and simplicity of his taste in form and in colour, preserved his superiority over his nephews, Annibal and Agostino. The former of these, however, strongly contested that point, by his powerful and free execution, and his great academical acquirements; but his mistaken application of them, more than counterbalanced their value; and of this, his great work, the gallery of the Farnese palace is an abundant proof.

The school which they formed for the improvement of their art, and which was entitled *l'Accademia degli Desiderosi*, but

PAINING.

but is now better known as the *Academy of the Carracci*, proved a source of information whence sprung many artists deservedly renowned. Among them were Guido Reni, Domenichino, Lanfranco, Albano, and Guercino. Amid the varied works of these able men, may be seen the imperfection of the plan adopted by their master. Each following the dictates of his inclination, differed from his fellow student in the objects of imitation, as well as in manner; and yet the school attached in measure to all, inasmuch as the art, in preference to nature, was the main object of attention with them generally. In some few instances, indeed, the reverse took place; and Domenichino, in his pictures of the Communion of St. Jerome, and the Cure of the Demoniack, rivalled, in feeling and expression, the fame of Raphael; qualities which had languished, and been neglected after the death of that renowned artist. See lives of the artists mentioned.

After this period the art continued to decline in Italy. The great talents of Pietro da Cortona, and Luca Giordano, were abused by the too great facility with which they satisfied the perverted minds of their employers. Nicholas Poussin alone endeavoured to stem the torrent of corruption in taste, which now flowed over the classic ground of former ages; but though he reverted to the pure source of Grecian art for his models, yet in severe criticism, he is justly said "rather to have copied its reliques, than adopted its spirit." He indeed is by some denied to the Italian school; but as the chief part of his life was spent in that country, and all the valuable information he possessed derived from his residence there, we have attached him to the history of its art; and with him closes all record concerning it, worthy of particular distinction.

To Germany the art travelled from Italy: at what period is not exactly to be ascertained; but it is not improbable that it was soon after the time of Giotto. It was not, however, till towards the end of the 15th century, that its progress there claims our attention. At that time Albert Durer relieved it from little better than obscurity, by his ingenuity, his fertile invention, and his skilful attention to minute imitation of individual forms. He carefully studied the human figure, but wasted his time in fanciful schemes for regulating proportion; and never attained the art of selection, or a station in the rank of exalted artists. Yet sometimes his compositions are well worthy to have been treated in the greatest style in design, and the colour with which he executed them, often rivals the best among the Venetians. The bane of the style, if it may be called so, is meagreness and poverty of forms, mean expression, and capricious and often vulgar invention. Lucas Van Leyden was the best of those who attempted to rival the name of Albert Durer, unless we except Holbein; who, though he never equalled him in composition, infinitely surpassed him in portraiture. The taste of the Germans totally changed after they possessed the knowledge of the works of Michael Angelo; when, with the constant effect of the sudden transition of extremes, the newly imbibed principles burst all reasonable bound; and were employed, only to be abused. Unable to penetrate the depths of its mysteries, its surface was extravagantly imitated by Goltzius, by Spranger, and a host of ambitious contemporaries; but the folly of this misapplication soon acted to its destruction; and in its decay bore down with it the character of the German school of painting.

The history of the art in the neighbouring countries of Flanders and Holland, is merely the same with that of its progress in Germany, till about the middle of the 16th century. The extreme richness of colouring which had been effected by John Van Eyck, was maintained entire; and

seems almost exclusively to have occupied the attention of the Flemish artists. Their distance from Italy, and the consequent want of intercourse with that country, precluded any precise acquaintance with the peculiar beauties of ancient art; and having no model to guide them, or rival to contend with, they were at liberty to follow the suggestions of their own inclinations. It conducted them to as precise an imitation of the effects of natural objects immediately presented to their eyes, as lay in their power to produce. The system of religion here, as in Italy, found occupation for the artists in a considerable degree; but its exercise soon deviated into common life, and reached its ultimatum in the days of Rubens and Rembrandt. The former of these "meteors of the art" shining in a sphere completely his own, irradiated the world with a brilliant and uncommon lustre. Possessed of a mind as full of genius as of energy; he appears without difficulty to have embraced from contemporary artists, and the great masters of Italy, whose works he visited, those elements of which he composed his own system. The principal features of which are, an union of the splendours of the Venetian school, with a grandeur of outline drawn from the Florentine, without its correctness, not untinged with the natural imperfections of his countrymen, and guided by his own individual brilliancy of imagination, and a total disregard of the beauty of the antique. But whencesoever he drew the first rudiments of his style, his application of it was immediately to nature, with all her varieties. Never man was less the slave of a style than Rubens: although it does not cease to appear in all his productions, yet it was moulded to his subject, of whatever nature it were, with the greatest facility; and he certainly added a gradation to the scale of the art by a manner peculiarly his own, and totally diversified from all others. Its great object was to captivate, and no man more completely succeeded in his design, in spite of the numberless defects with which his works abound. To use the words of Sir J. D. Reynolds, "such is the fascination of his pencil, that it is only when we are removed from its influence, we are willing to acknowledge any inferiority in Rubens, to any other painter whatever." (See RUBENS.) He was truly the father of the Flemish art; and under the influence of his example and subsequently to his decease, so perfect a cultivation of the means of imitation, both in drawing and colouring, and also in arrangement, took place in Flanders and in Holland, that a new species of art was produced, unknown to any other part of the world; and during the course of the 17th century, furnished those countries wherein it arose, with innumerable works of the greatest perfection in their kind.

At the beginning of the century, that most extraordinary and original luminary of the art, Rembrandt, appeared; and aided the power of Rubens in completing the perfections of the Dutch and Flemish schools. In him the world possessed another of those men of powerful genius, who created an atmosphere of art for themselves, and moved within it uncontrolled, with a security that sets imitation at defiance. What Correggio had given to the Italians, Rembrandt bestowed upon the Dutch; chiaro-scuro concentrated, or expanded; rivalling the purity and brilliancy of nature. That, and colour, were his immediate agents; with which he played at will, in all the varieties which a vivid imagination and close observation of the more striking effects of nature, could possibly supply him; and not unfrequently by their means gave beauty even to deformity, at least robbed it of disgust, and rendered it engaging to the eye.

The characteristic features of the schools, at the head of which these two extraordinary men are duly placed, are, a perfect skill in combination and arrangement of chiaro-scuro,

scuro; great strength of natural and local character; and a precise truth of imitation, even almost to perfect deception in form, colour, and effect. These powerful qualities are, however, too constantly degraded by a low and vulgar application of them, particularly among the painters of the Dutch school. Among the Flemings, many of the pupils of Rubens adhered to his class of subjects, and exhibited a brilliancy of imagination, and power of execution, worthy of the source whence they proceeded. Vandyke more especially; who, in point of chastity of design, and purity of colouring, excelled even the power of his master, though he had not his capacious genius, to whom the representation of all things seemed equally facile, and whose abilities seem to have been enlarged according to the sphere he was called to act in, or the canvas he was employed to cover.

It would be useless to enter into a minute detail of the progress of the art in those countries. The lives of the various artists who maintained it for a time, supply the necessary information; and their names are, in general, familiar to our readers; we therefore refer to them for further information. See JORDAENS, CHAYER, DIEFENBECK, KONING, METZU, TENIERS, NETSCHER, &c. &c.

The history of the patronage of the art in Holland and Flanders, lies within a very short compass; as it rested almost entirely with the church, who called for altar-pieces, (and their chapels were filled with them,) and the munificence and taste of private individuals. Very few, indeed, of their public establishments were adorned with pictures, notwithstanding the immense fund of abilities the countries possessed; and it was left to find its own interests, by gratifying the taste for portraiture, among the rich merchants and burghers; or the execution of small pictures, within the scale of admission to private rooms, on subjects of ordinary interest, of landscape, or of vulgar amusement. Its practice in those countries failed completely soon after the commencement of the 18th century.

Very little of the progress of the art in Spain is known previous to the year 1500; though it is scarcely probable, considering the intercourse between that country and Italy, Naples more especially, that it had not much previous employment there. Soon after that time, the renown of Titian, and the favour in which he stood with the emperor Charles V. the example afforded by the portraits he drew of that monarch, with the high honour he received from his son Philip II., and his own residence for a few years (according to Palomino Velasco) in the country, roused a spirit of emulation among her natives. And as far as an excellent power of individual imitation, and of gentle, amiable feeling, in composition and expression, will bear a rank among the higher qualities of the art of painting, the Spanish nation may justly claim their share. But the best works of their best painters, give them no just title to any proportion of the homage due to the great masters of Italy, who exercised successfully the grand style. Nevertheless the style of the best Spanish artists is of no mean quality. Spagnoletto certainly selected for himself an original one; the principal foundation of which he had gathered in his studies from the Italian masters; and which, when properly adapted to subject, presented an air of grandeur, forcible, yet severe. But he stood alone in it. A milder and more amiable feeling characterises the manner of the historical painters of his country, as is testified in the works of Coello, Morales, (El Divino,) Murillio, Carrero, Herrera, and others; whilst the bold freedom, and mastery of hand acknowledged to have been possessed by Velasques, with the singular reality of his portraits, places him upon a level with Titian and Vandyke in that peculiar branch of

the art. The gay luxuriancy of the pencil, in the hands of Luca Jordano, employed to cover the ceilings and staircases of the Escorial, and other royal palaces; and the very high honours and emoluments bestowed upon him, and others of the like taste, assisted, no doubt, to hasten the downfall of the art in Spain; in which country it disappeared, as to any effective prosecution of it, about the same time that it did in Italy and in Flanders. The late turn of events in the Peninsula, has made us better acquainted with the productions of Spanish painting than we formerly were; and more intimate acquaintance serves to increase respect for the simplicity and suavity of the general taste of their best artists. But their productions were not very numerous, and are difficult to be obtained.

In France the adoption of Lionardo da Vinci by Francis I. after he had left Italy, (and in whose arms he died,) together with the powerful talents of Primaticcio, of Rosso, and of Nicolo Abbati, employed by the same monarch to paint in fresco the chambers of the royal palace of Fontainebleau; it might have been imagined, would have laid so strong a foundation of exalted taste in the country, where it came with all the charms of novelty, that it could not but have been pursued by a people eminent for their ingenuity, with a degree of success rivalling the neighbouring country of Italy; more especially as they had perpetual intercourse with it, and were under the influence of the same system of religion, which had there adopted painting as a portion of itself. Yet very little arose from these admirable examples; and the only French painters whose names have come down to us of any pretensions to excellence for the next 150 years, are Jean Cousin and Jacques Blanchard. The former lived towards the end of the sixteenth century, and was a skilful designer, though in a meagre taste. He painted principally on glass. (See COUSIN.) The latter was of somewhat later date; and having, by study at Venice, acquired a taste for Venetian design and colouring, he obtained the name of the French Titian, and his works were much esteemed. After these, the art did not rise in France, till Poussin, having imbibed a taste for its excellencies in Italy, returned to his native country, but with reluctance, at the invitation of Louis XIII. Although the treatment he received was handsome, and becoming both patron and painter, yet he found the taste of his country not formed to relish the simplicity of his style. The facile mediocrity of Simon Vouet received more admiration; and Poussin, disgusted, returned to his tranquil life at Rome; leaving the field to a competitor, who laid the foundation of that flutter and frivolity, which characterised the style of the French school previous to the revolution. Le Sueur, indeed, felt like a man of a pure and elevated mind; and spurned the trammels imposed by the style of Vouet. The chastity, the feeling, and purity of the soul of Raphael, seem to have been infused into his mind, and exhibited itself in the series of pictures painted for the convent of the Chartreux at Paris, and known as the life of St. Bruno; in the burning of the books of magic at Ephesus, &c. &c. But no preparation had been made to receive so pure a taste as Le Sueur's; and in a court where ostentation took place of magnificence, its suavity and gentleness were ill capable of withstanding the brilliant, but false glitter, which accompanied the exertions of his fellow student under Vouet, Charles le Brun. He sunk under the unjust abasement, and fell a victim to mortality at the early age of 37; not without leaving cause for a suspicion of his having been poisoned.

His fortunate competitor Le Brun, formed, by the great extent of his ability, an era in the history of the art in France; and stands unrivalled in his style, as the acknowledged head of the French school; the deity of its succeed-

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ing artists; and the theme of their eternal adoration, to the utter exclusion of all the real great painters of Italy, of Flanders, or of Spain. And if a vigorous imagination, and powerful execution of rich combinations, in forms, and colour; with an eye and a hand, which arranged with facility the various parts of extended compositions, and united them as a whole; will effectively weigh against the want of simplicity, natural expression, and purity in design; then he well merited the distinction given him by his countrymen. The splendid arrangement of the gallery of Versailles (now in danger of perishing by the neglect that palace experienced during the days of republican France) is a satisfactory proof of the extent of his abilities; and when his battles of Alexander are placed in conjunction with it, we can no longer wonder that such a display of talent, so congenial to the mind of that vain ambitious monarch, Louis XIV., completely overpowered all competitors. During his long reign, talent of all kinds shone conspicuous round his throne; and painting was consequently elevated and encouraged; the splendour of the court, and the dignity of the king, being made the principal objects of attention by its professors. An academy of painting, &c. was formed at Paris, under the immediate patronage of his majesty; and another at Rome, for the benefit of French students. Vander Meulen accompanied him in his campaigns, and painted the principal events that occurred, to perpetuate his renown. But a more classical tribute of homage was required of the art, in that age of learning. In imitation therefore of Cæsar, who had perverted the pictures of Alexander, painted by Apelles, to his own exaltation, by adopting them as symbolic of that power which he had created for himself; so, by the instrumentality of Le Brun, Louis XIV. contrived to make the victories of that immortal conqueror emblematic of his own restless ambition, and his love of false glory, on which he prided himself, but for which no real hero fights, when it must be purchased at the dread price of suffering humanity. The grand monarch, however, in this mistaken application of the art, acknowledged the utility of it, as an agent of glory to himself, through the medium of a more magnanimous prince, who conquering but to conquer, lightened a weight of execration by exhibiting many traits of real heroism. And the result has been, another proof added to the testimony of former ages, of the increased renown which may be acquired by a monarch and a country, from a cultivation of the arts which adorn human nature, above that derived from political causes.

If even the firm basis of nature, upon which the style of Michael Angelo was founded, did not preserve it from perversion by his imitators; it was not likely that Le Brun's, built as it was upon the sandy foundation of artifice, should share a happier fate. As it led the way in substituting theatrical for natural taste, in gesture and in expression, and had obtained such a commanding influence by its success; those who adopted it appear to have imagined that the former was the best prototype of the two; and accordingly the stage, and its artificial airs and graces, which were ready made to their hands, and prevented the difficulty and trouble of searching and selecting from the coy haunts of nature what was necessary for their works, was made the subject of their imitation. But no want of ability appears in the men who immediately succeeded Le Brun. The wonder is that men endowed with so much talent, could have submitted their understandings to so false a taste. Sebastian Bourdon, indeed, rushed from it, and with true poetic feeling endeavoured to imitate, and often very successfully did imitate, the purer taste of Poussin; but Pierre Mignard, Jouvenet, Champagne, and Rigaud, rushed into the system, till it became reduced to pompous no-meaning flutter; and in the hands of

Van Loo, Bouchet, &c. lost all trace of its masterly origin, and sunk into contempt, even in the country where it originated. In a more minute detail of the progress of the art than our limits will admit, the names of Watteau and of Vernet ought not to be overlooked, the former, particularly, who created a pleasing style of execution and colour, and exhibited it in sportive scenes of imagination drawn principally from the amusements of the higher circles; and the latter introduced a taste for landscape and views of sea-ports which had been unknown till his time, but was too artificial in his colouring.

When the terrors of the recent revolution had somewhat subsided, and in measure even during its course, it was thought proper in France to revolutionize the taste of its arts. But whether the fervour of hatred to royalty, the determination to exterminate all remnants of it, even to its bounties, or a real feeling of the indirect course which the taste of their school of art had taken, guided them in the choice of their present style of design, and was the cause or not of the change, certain it is, that in its vibration, it has gone as far beyond the true line of propriety on the one side, as it had before done on the other. In place of the pompous display of figures in affected attitudes, overloaded with draperies of rich stuffs flowing in all the parade of unmeaning magnificence, a dry and insipid imitation of Greek sculpture is adopted; and in spite of the immense mass of perfect exemplars, in the works of Raphael, of Titian, of Domenichino, and almost all the renowned masters of Italy and of Flanders, &c. with which the gallery of the Louvre abounds, and which, with a superior judgment, the government leave free to their study; the present rulers of taste in France have marked a line of conduct for the students, imitative of the condition of painting before those masters were born. Rejecting the efforts of the happy period of its maturity, they prefer resorting to the infancy of the art, with about as much propriety as a man who is desirous of walking might tie up his legs, and throw himself into the arms of his nurse. Whether the minute attention now given by the French school to drawing, and the peculiar taste in which it is directed, *viz.* to the adoption, in painting, of the forms which appear to belong exclusively to sculpture, be likely to produce, in any length of time, the end proposed, is extremely problematic. We rather suspect the system must be changed ere they will reach the object of their wishes; and then perhaps this preparatory attention to simple forms may have its due effect.

It has remained to our time, that it should be said of England, she had a school of art appropriately her own.

So very little is known of what occurred concerning the art of painting in this country, previous to the time when Henry VIII. encouraged the abilities of Holbein in portraiture, and invited Titian to come here; that it would be useless to endeavour to trace its history. Enough, however, is known to satisfy us that it was at a very low standard. It was but little before his time, that the people of England began to throw off the yoke of ignorance and barbarism; and to cultivate literature and science. The ambition of Henry to be renowned, and his spirit of rivalry to his great neighbour Francis I. of France, were quite sufficient motives to stimulate him to the proud aim of becoming a patron of the liberal arts; had not his theological discussions with Luther, and afterwards his more sublimary quarrel with the pope, so powerfully diverted his attention from them; and produced him so active an employment in deciding the course of the reformation in religion which consequently ensued. But however great be the cause that England has to rejoice in the general fruits of that change in religious principles and government; its effects were fatal to the cultivation of the

the arts of painting and sculpture. Those arts, particularly the latter, being then so thoroughly interwoven with the system of the church of Rome, were of consequence as thoroughly opposed by that of England, set up in defiance of its authority. Had the arts at this time, when the nation was new-modelling its character, been adopted by the reformed system of religion; and had they accompanied it with progressive steps in its course to our present state of cultivation; we might, together with our just privilege to boast of an exalted rank as a nation, in literature and science, have likewise heightened our importance by exhibiting a settled style of historical painting. But it was nipped in the bud, and to this day has not overcome the effect of the chilling blast of disappointment and neglect.

In the succeeding reigns of Edward VI., Mary, and Elizabeth, some few portrait painters, natives some, but principally foreigners, exerted themselves to gratify the desires of our nobility, and preserve their features to the admiration of posterity. St. Antonio More, Frederick Zuccheri, Isaac Oliver, Lucas de Heere, and others of less note, supported this branch of the art with varied success. But during the long and splendid reign of the latter of the three sovereigns, not only was encouragement denied to historical painting, but the very humble, and even graceful attempt made by the dean of her majesty's chapel, Dr. Symson, to afford her pleasure from the sight of prints upon religious subjects, met only with the severity of rebuke. (See Strype's Annals.) Whether it were natural bigotry, or political necessity, which incited the queen to the use of the repulsive air she assumed, it acted like a command upon the church. "Who," said she to the doctor, "engraved those prints?" A German. "It is well it was a foreigner, or we should have enquired into it," was the royal rejoinder, which gave the cue to the clergy, throughout the kingdom, for the "expunging of all paintings on the walls of churches, and the substitution of passages of scripture in their stead;" and from that time to the present hour, the prejudice, except in a very few instances, remains in full force. Thus was that channel through which alone the plastic arts had ever been introduced with success into any country, closed upon the efforts of the English; and by that hand which, if conducted with true and enlightened policy, ought to have fostered it. Nor can we be surprised if the people, ignorant and overheated as they were with religious zeal, should unite in the feelings of their governors.

Charles I. endeavoured to introduce a feeling for the art, which his father had almost entirely overlooked; but for which he appears to have had a very great affection. He employed Rubens during his short residence here, as envoy from the king of Spain, to paint the ceiling of the banquetting room, now the chapel of Whitehall; and procured a treasure of inestimable value to the country, by the countenance and encouragement he afforded to Vandyke; and also to other ingenious foreigners, who have enriched the country with their productions. He formed a very considerable collection of pictures, in addition to those already possessed by the crown, and at the suggestion of Rubens bought the cartoons; he employed an artist to copy the works of Titian in Spain, and purchased the cabinet of the duke of Mantua, at the cost of 20,000*l.* (see Walpole's Anecdotes, Car. I.) and some were sent him as presents. The whole were sold and dispersed by the parliament in 1643, who gave especial orders, "that all pictures which had the representation of the Saviour or the Virgin Mary in them, should be burnt." After the restoration many of them were returned to the Royal Collection, but only to meet utter annihilation by the fire which consumed the palace of Whitehall.

Of the natives of England, few caught the flame of desire to imitate them even in portraiture, not one in history. Of the former, W. Dobson took the lead, and succeeded in painting a head with great skill; but there his abilities rested. His exertions, and those of his contemporaries, were arrested, almost entirely, by the Gothic barbarity of the puritanical system which followed; and the taste of Charles II., whatever he might have acquired from his father, was only immersed in impurity and frivolity, by his long residence at the French court; where he acquired a taste for that parade and pompous display of magnificence which was the ruin of the French art.

Verrio, and Benedetto Gennaro, were the protégés of this monarch. The former was employed by him to decorate the ceilings and walls of the royal palace of Windsor; and received for the extravagant load of ingenious absurdities with which he covered them, to the amount (according to Walpole) of 5500*l.* and upwards. Of the latter, there are several pictures at Windsor, in a style of dull imitation of Guercino, of whom he was a nephew. In portraiture sir Peter Lely filled with very great ability the place which Vandyke had held; and in an original and very agreeable manner, he often rose to a station very nearly approaching that of his great predecessor. In the expression of beauty he frequently surpassed him; and was a far more agreeable painter to the ladies. Sir Godfrey Kneller, likewise, in this reign began his long career of portrait painting; he succeeded to Lely's fame upon his decease in 1680; and as an artist was utterly ruined by success. Had he been under the necessity of labouring with care to support the great name he enjoyed and abused, he had talents efficient to the purpose. Witness for him, the converted Chinese at Windsor, the portrait of Newton at Petworth, of Dr. Meade at Oxford, and many others. But he lived and practised painting for five successive reigns, almost without a rival, making gain rather than fame the object of his desire. Dahl, who was a Swede, was the only one who interfered with his practice, to any extent. Wissing, his countryman, threatened, by his carefulness in finishing, to have more effectually counteracted him; but he, unfortunately for Kneller's reputation, died young.

In historical painting, no English artist had appeared to rival the productions of foreigners introduced here, in any degree, till at length sir James Thornhill, born in 1677, arose to contest the honours of the palette with La Guerre, who had been employed to adorn the halls and staircases of many among our nobility. The style he adopted, like that of his rival, was but a lower imitation than Verrio's of the French school; and by no means served to elevate the taste of the country. However, the state did him the justice to employ him in the decorations of St. Paul's and at Greenwich, in which he was most materially assisted by a German of the name of André: but such was the humiliating nature of his engagement, that he was paid at the rate of 40*s.* per square yard. With him properly commences the history of English art, though portraiture, as we have noticed, had been practised by Dobson after Vandyke, also by Riley, and by Cooper, who was a very ingenious artist, in miniature. But after them, it sunk lower and lower, in the hands of Greenhill, Jervas, Richardson, (who, notwithstanding, has so admirably written upon the art, and exhibited in his essays a true feeling for those excellencies which he could never exemplify by manner;) and hundreds of others whose names it would be cruel to rescue from oblivion; for the mania for portraiture did not cease, though the ability of the artists was fast verging to utter decay. What sir James Thornhill had done in historical, or rather decorative art, found no very successful imitator; so that to use the words of Horace Walpole, "in the com-

PAINING.

mencement of the reign of George I. the arts of England were sunk almost to the lowest ebb;" and with the still greater authority of sir Joshua Reynolds we may add, "lower they could not well be."

That such should be our degraded condition in the art of painting, which from its value and importance, when properly applied, has been so justly considered as essentially useful in promoting the dignity of a state; and that, at a time when, in political importance, in science, in poetry, and philosophy, we held so high a station among the kingdoms of Europe, where it had been cultivated with success, must, at first sight, appear somewhat paradoxical. A little consideration upon the circumstances which have counteracted its growth among us, will, however, at once satisfactorily dispel the surprise it necessarily occasions. In no nation has the art been known to rise spontaneously to perfection. We have seen it in Greece and Italy gradually gaining strength through accumulated years, growing as it were with the people. "The artist and the age," Mr. Barry has observed, "were so fitted to the weakness of each other, that admiration was kept constantly alive during the whole successive progress from barbarism to perfection." When it was first introduced from the earliest sources of cultivation on the continent, this was the time to have encouraged it, and taught the nation to imbibe a taste for its beauties; and then, by degrees, it might also have reasonably been expected to have improved among us. Whereas the circumstances related above, exhibit it, on the contrary, rebuffed, before it had taken sufficient root, and what lighter branches had attached themselves to the soil, torn with violence from its nourishment. The earlier works of the artists, whether British or foreign, being expunged from the churches, and the seal of authority placed against their future admission; together with the breaking up of the monasteries, and the consequent dispersion of those bodies of men, to whom at least mankind are indebted for the maintenance of literature, and the arts during the dark ages, settled completely the fate of historical painting in England. The favourable moment for employing it in any other than a religious course elapsed; and the general tone of education among the people, not having fitted them to receive its influence, except as attached to religion, what little had been adopted was stifled in its growth. In the mean time an accumulation of pictures gradually took place; the produce of other countries, where the art had been more regularly attended to, and the habit of resorting to the continent for information gaining strength, the acquired ideas of our nobility and gentry rose above the power of the uncherished artists of the country, which those who guided public taste upon too just grounds decried; and thus an evil which to this day operates to depress our artists, commenced its preponderating influence.

The circumstance apparently most surprising in this matter, is, that when the powers of Vandyke were so long and so widely displayed in England, and portraiture so much encouraged, that so few of her artists should have followed in his track, or that taste should have swerved so completely from it. But the fact is, that British students were inclined to pursue it, witness Dobson and Riley; and Jamesone in Scotland; and they succeeded to a very considerable degree. It could not, however, be expected that when there had been so little food for nourishment offered to artists, that they should at once spring to perfection, unless endowed with genius in a higher degree than even the renowned master whom they emulated. No one was immediately found equal to that, and the allowances created by his exquisite abilities, had scarcely subsided into regular study, when Lely appeared to usurp his station, and spread the peculiar beauties of his own ready

pencil in the way; gratifying the court, and, consequently, guiding the taste of the country. Kneller succeeded rapidly to him; the English artists had not time to rise; and imitation of the reigning influence was alone left for them; as no one advanced with sufficient power of mind to steer successfully in a track of his own.

The period at length arrived, when England, exerting her native energy, advanced in her turn to enjoy a share of renown among the cultivators of the art of painting.

The principal difficulty in the outset of this event, was to rescue the art from the degrading influence of a vicious taste, to retrace the steps of our predecessors, or rather, to burst the bondage in which they had enthralled us, and resort at once to the original principle of imitation; which, when pure and select, is the only sound basis of the art. The first step towards it was the establishment of a school for drawing from the living figure. This had been begun by sir James Thornhill, in most inexplicable conjunction with sir Godfrey Kneller, who one would imagine, from his latter works, had left all consideration of the value of such a thing far behind. Thus, however, he assisted in laying the foundation of a remedy for the evil, which he more than any other had occasioned. This school, sir James continued at his own house in the Piazza for some years. His death, in 1734, obliged the artists to procure another situation, which was not effected without some difficulty; for the people were so unprepared to consider the study from the naked figure as necessary to the artists, that their meetings were even suspected to be held for immoral purposes. Another school was at length formed by Michael Moser, a native of Schaffhausen, and a chaser by profession, and six other artists, principally foreigners, the management resting with Moser. After a while they were visited by Hogarth and others, and a larger body was formed in consequence, who established themselves in Peter's-court, St. Martin's-lane, in the year 1739. Having acquired some property by combined exhibitions of their works, they solicited a charter of incorporation, and the scheme being sanctioned by the king, their charter was granted in 1765. But dissensions arising in the body, a secession of many of its principal members took place, and the result was the establishment of the Royal Academy in 1768, under the more immediate patronage of his majesty; sir Joshua Reynolds being nominated its first president. *Edwards's Anecdotes of Painters. Introduction.*

In conjunction with these more active exertions of the artists, there did also arise in the minds of many gentlemen of improved understanding, a wish to see the art of the country emancipated from the shackles of the artificial taste which was imposed upon it, and societies were formed, which made it an object of attention, and excited a more general regard for it. But this was not till after the time when the artists had forced their way into notice; more especially Reynolds, Hogarth, and Wilson.

Richardson, who died in 1745, at the advanced age of 80, unable by his pencil to rival the real beauties of Vandyke, of Raphael, or others whose names stand on high record, endeavoured to make amends by his pen, and in 1715, published a book full of high encomiums of the merits of those masters, and of useful observations on the theory of the art of painting; and in 1719 another, on criticism, and the science of a connoisseur; works of which nobody will be inclined to dispute the merit, who knows the value which sir Joshua Reynolds placed upon them; and particularly the former, which he declared confirmed him in his love of the art, and elevated his ideas of its professors. In it, Richardson contended for the propriety of painting portraits in the collume of their time; a dangerous symptom of feeling

PAINING.

ing for the continuation of the system of loose robes introduced by Kneller, when common sense began to resume her influence in the minds of artists. Hudson, the son-in-law of Richardson, with the help of Van Alken, (a Fleming,) and in rivalry with Van Loo, (a Frenchman and brother to Carlo Van Loo,) profited by the suggestion, and ventured to reject the nonsensical draperies in use at the time; and instead of loose unmeaning pieces of varied fluffs thrown in artificial folds over the shoulders of the gentlemen; and the affectation of grace and grandeur in which the ladies were represented *en chemise*, half exposed and half enveloped in one ill-contrived piece of silk, as if they had carelessly thrown on a mantle when rising from their beds, he dressed them in the formality of the day; and his Flemish assistant painted their silks and laces with great care and exactness. Hayman also, who had succeeded Sir James Thornhill as a historical painter, upon the same ground felt himself at liberty to preserve the uniforms proper to those whom he introduced into his pictures; and no longer by a senseless magic converted them into Roman centurions or Grecian heroes.

Thus, by the aid of the schools we have mentioned, and their own good sense, the attention of English painters was at last steadfastly attached to the first principle of their art, imitation, from whence they might rise; instead of being distracted by that which properly belongs only to its decay, ornament, from whence to proceed must be to fall. It was comparatively of no import, that the materials which they had to imitate were detestable in themselves; and nothing could be more repulsive to good taste than the toupees and stiff skirts of the men, and the starched ruffles, high heads, and hoop petticoats of the women. Attention to actual representation in the first instance, appears to have been the only means by which the vile spell that controuled them could be effectually dissolved. That once broken, and a cultivation of taste taking place on better grounds; and when a real knowledge of what was truly admirable in art, and attainable in its practice, had been assiduously cultivated by our artists in Italy, unshackled by any extraneous trammels, and exerting their judgments in a right unbiassed direction; it no longer appeared problematic, whether England might, or not, produce painters, as she had done poets and philosophers. The chains which had prevented her native exertions, had been forged imperceptibly by foreigners, who reviled her, aided by unfortunate political circumstances; and it is not a little striking, that when she rejected their influence, when all pretensions to art were sinking upon the continent, and those countries where it had most flourished, ceased to produce painters of eminence; that, at that very time, England should step at once from her obscurity, and illumine the deadened atmosphere of art, with an irradiation of no common lustre.

It were useless to trace the progress of the art in the hands of those who in minor degree assisted in this enfranchisement of it in our country; "or recount the stammering and babbling of its infancy;" for as such, its condition at the time of which we are speaking may be regarded. It scarcely enjoyed the period of youth, for when Reynolds and Wilson returned from Rome, they rushed at once with it to maturity in portraiture and in landscape. And when West, having by his British connections in America imbibed a true taste for its beauties, had also cultivated it in Italy, and came here to devote his life in its service, all that had been done in history, by Hayman, by Pine, by Wale, and others, was instantly sunk in oblivion.

Hogarth, however, demands a rescue from the mass of our earlier artists. With a marked originality of feeling,

he pursued the art as his own taste, or rather fortune, guided him; and traced a line for himself totally unknown to any other, though more in the application of the art than in itself. Yet in his latter pictures, particularly in his *Rake's Progress*, and the *Marriage-a-la-Mode*, he exhibited a thorough feeling for the beauties of the Dutch school; executed in a broad style of his own, and proving, that if his youth had been employed in painting pictures, instead of engraving silver tankards, he might have rivalled the best among them.

In landscape, Lambert had advanced beyond the steps of his contemporaries; and produced with some talent, a kind of union of the peculiarities of Gasper Pouffin, and Claude. But when Wilson expanded his brilliant, chaste, and glowing tints, in ample masses of light and shade, over the canvas; the art seemed to leap at once ages in advance; far too rapid, indeed, for the taste of the public; or the benefit of its (subsequently) adored professor. See *Life of Wilson*.

Whatever had been done here in portraiture, from the time of Vandyke and Lely till 1752, when Reynolds returned from Italy, was then utterly annihilated by the display of his splendid talents; the foundation of all, which this branch of the art boasts in the English school. Not but that there have been and are exhibited various deviations with original feeling, from his peculiar taste; but his is the acknowledged and undoubted claim of superiority, as of priority. His best portraits are inferior to none, for truth of character, and style of treatment; in many points they are superior to those of all the portrait painters who ever lived; and to his talents, exhibited in the various works collected by the British Institution, and opened to the public during this last summer, (1813,) the nation has, by acclamation, declared its homage, and acknowledged its obligations. See *Sir JOSHUA REYNOLDS*.

With respect to the practice of the higher style of historical painting in this country, the rank it merits is so much the almost exclusive privilege of artists now living, that it is not easy to know how to state the sentiments which liberal and candid criticism dictates concerning it. Partiality may blind, or true criticism, if given, may be misconstrued to flattery, or some principle of a meaner kind. It must be left, therefore, to posterity, to give the due meed of praise to those, who have exerted themselves against innumerable difficulties, and endeavoured to uphold the true spirit of the art in this, its most arduous application; and persevered, till at length something like an inclination to encourage their efforts appears to arise, where alone it can be effectual. No one can for an instant hesitate to declare their sense of the exalted abilities with which it has been, and is supported; or cease to wish to see them duly engaged.

Of those who have practised in this branch of the art, and are departed, Reynolds, Romney, Opie, and Barry, require to be particularly mentioned. The former with all the splendour of chiaro-scuro and colour, which no one since Rembrandt has wielded with so much authority, exhibited in his pictures of Hercules strangling the serpents, Macbeth, cardinal Beaufort, and Ugolino, a fund of historic power. Romney also had poetic imagination, feeling and expression; and in the little leisure allowed by his general practice of portraiture, indulged in the delights ideal subjects afforded him; while Opie presented "images new and striking, drawn directly from nature," and "what he wanted of academical or classical information, he compensated for, in great measure, by character, by force, and by a just and bold imitation." But of the four, Barry was the only one who had regularly educated himself for its practice, and undoubtedly had the

PAINTING.

highest and most enthusiastic feeling for its best qualities. With a generous zeal worthy of the highest encomium, he broke entirely from all consideration of the ordinary style of subject, or design; and contemplating his art in the most exalted manner, attempted to embody the elevated ideas he entertained. His most sincere admirers must, however, regret, that those excellent sentiments, which he so ably inculcated by his pen, were not more completely supported by his pencil; yet, his productions of the series of pictures upon the culture of man, in the great room of the society in the Adelphi, notwithstanding their imperfections in the executive part, must ever remain a marked event in the annals of historical painting in England.

For further illustrations on this subject, see PICTURE.

Colours employed by the Romans in Painting, in the time of Pliny. See Pliny, lib. xxxv. caps 6 and 7.

WHITES.

- Melinum.* A native white earth, from the island of Melos, used by Apelles before white lead prepared with vinegar was invented.
- Paratonium.* An Egyptian white earth, used in distemper; and similar probably to the white now called Cremnitz white, from Hungary. Pliny complains that paratonium was frequently adulterated with Cimolian earth, which was used by the fullers at Rome.
- Eretria.* An ashy white. It is named from a town of Eubœa, now Trocco.
- Cerussa.* White lead.
- Anulare.* Gypsum.
- Creta.* Chalk.

YELLOWS.

- Sil.* Ochre of four kinds; named Atticum, Lucidum, Syricum, and Marmorofum.
- Auripigmentum.* } Orpiment.
- Arsenicum.* }
- Cerussa usta.* Masticot, first discovered by the fire at the Piræus.

REDS.

- Minium.* Red lead, both natural and artificial. The best native minium was found in a quicksilver mine near Ephesus; and in endeavouring to extract gold from it, Callias, the Athenian, discovered vermilion.
- Vermilion.* The same as now used.
- Sinopis.* A red earth. The best was found near Lemnos, and was so valuable, as to be sold sealed up. It approached near in colour to minium.
- Rubrica.* A red earth.
- Cinnabar.* Native Indian name for dragon's blood.
- Sandaracha.* A red orpiment.
- Sandyx.* By some thought to be vegetable red, and obtained somewhat after the manner of our lakes, viz. absorbing the colouring matter of a decoction of the vegetable matter in chalk.
- Purpurissum.* A lake made from the ingredient used in dyeing purple, being absorbed in tripoli.
- Syricum.* A mixture of sinopis and sandyx

BLUES.

- Armenium,* or } Verd'azur, or blue vitriol. Pliny calls it a
Azure, also } sand; and says there were three kinds,
called *Ceruleum.* } viz. the Egyptian, the Scythian, and the
Indicum. } Cyprian.
Indigo.

GREENS.

- Chrysocholla.* Malachite, or mountain green.
- Appianum.* Another of the same nature.

BLACKS.

- Atramentum.* A common name for all black colours. Pliny speaks of one kind, as oozing from the earth; and it may possibly have been some kind of bitumen. Of another, as being made from smoke of rosin and pitch. Burnt lees of wine, or husks of grapes, produced another, used under the name of Truginon, by Polygnotus and Micon; and another was invented and used by Apelles, by burning ivory. That being made thin by some vehicle, was probably the atramentum or varnish, which he is said to have laid over the surface of his pictures. What the vehicle was is unknown; perhaps, as the mode of painting with wax by heat was practised, it might have been some modification of that material.

According to Pliny, "Apelles and other ancient artists used only four of the colouring substances mentioned above. But if we are to give him credit for the propriety of the praises he bestows upon their productions, we are under the necessity of denying it to him in this matter. Had he not specified the substances themselves, and we had been left to imagine that they possessed others more perfect in quality, the assertion might have been admitted; because, philosophically speaking, four perfect colours, with all their combinations, are certainly adequate to every purpose the art of colouring could require. Unfortunately for him, the substances he has mentioned are not in their nature equal to the power of those we now possess: and the practice of art, even with our present advantages, denies the knowledge of any four pigments, equal to the production of a work worthy of being denominated a fine piece of colouring. He says, lib. xxxv. c. 7. that "they used only MELOS for white; SIL, attic ochre, for yellow; SINOPIS, red; and ATRAMENTUM, black." He has before observed, that "Polygnotus and Micon used a black made of grape husks," which is a *blue-black*; and probably the greyest they had; but this is no substitute for blue, worth mentioning. The mere enumeration of them must suggest to every artist, the utter impossibility of producing any work of fine colouring from them, unless in a very confined scale.

The pigments in present use are very numerous. Those employed in fresco, have been mentioned under that head. The principal ones fitted for the general purposes of oil painting, are, *Cremnitz white, white lead* of different kinds, a fine yellow lately discovered from chromate of iron, *King's yellow* or *orpiment*, *Naples yellow*, *patent yellow*, *ochres*, *Dutch pink*, *terra di Sienna*, *yellow lake*, *red lead*, *vermilion*, *red ochre*, *Indian red*, *Venetian red*, *lakes* of various kinds, *brown pink*, *Van Dyke's brown*, *umber*, *burnt and unburnt*, *terra di Sienna*, *burnt*, *Prussian* and *Antwerp blue*, *ultramarine*, *ivory-black*, *blue-black*, *asphaltum*. These

PAINTING.

are the principal colours for the palette, but there are a variety of others, which are employed for particular purposes, such as verdigris, &c. &c. The natures of these colours may be known by reference to their particular specifications.

The oils best adapted to the purpose of painting, are *poppy*, *nut*, and *linseed oils*; and in this climate a preparation of the latter, by boiling it with some siccativæ, is in very common use. See OILS.

The varnishes most employed are made from *gum mastic* and *gum copal*, the former dissolved in spirit of turpentine, the latter in oil, &c. (See VARNISH.) To those who desire more minute information on the subject of colours and vehicles, we recommend the perusal of P. F. Tingry's Painter's and Varnisher's Guide.

The preparations of grounds for painting upon, is matter worthy of particular attention. The mode now most in use is of absorbent ones; by which the oil being taken up, is of course prevented from coming to the surface of the painting, and giving its own yellow hue to the work. Absorbent grounds are made of different materials. Some employ plaister of Paris, others pipe-clay, whiting, and size, &c. The former are apt to take up the oil too quick, and render the colour too stiff to work agreeably; and the latter are always liable to be affected by damp. A better one than either is produced, by grinding the colour in water, and then mixing a little oil with it. This does not cause the disagreeable effect above-mentioned, and is always firm. One great object in laying on the ground, is not to give too much of it; but just sufficient to cover the threads and interstices of the canvas, or the grain of the wood: if too much be laid on, it is in danger of chipping off, or of cracking.

For the practice of the art of painting, it is very difficult to give many efficient rules. The principal objects which require attention, are to let the preparatory colours be lighter and cleaner, (that is rather more grey,) than those with which

it is intended to finish, and to take care that the full form be made out with the under colour, before any proceeding is made with the finishing ones; which ought not to be disturbed in their hues; and to be employed only to strengthen those prepared, and give lightness and delicacy of execution. It is also desirable in painting, that the colours be disturbed as little as possible with the brush; and not be too much blended, or softened; but rather laid on with touches, beside each other; as that tends to keep them pure; whilst too much fretting causes them to become muddy, and to change in drying. The first part of the process of a picture, after the artist has fixed in his own mind a full idea of his composition in all its material parts, is, for him to draw correctly the general forms, and then begin to paint in his chiaro-scuro, with as simple a scale of colour as possible; and fully to satisfy himself on that head before he proceeds with his positive colours. This is the readiest mode of avoiding confusion and the necessity of frequent repetition; but there are almost as many modes of process as there are painters; each varying in some respect from the other, and every man's practice, either by accident or principle, furnishing him with varieties. Too great an adherence to system, is certainly not favourable to advancement; yet without a system, much time is necessarily lost; and it seems most reasonable, that every artist should commence with one, however he may find it necessary to vary from it in his progress. Rubens, and most of the Flemish school, evidently exhibit theirs, by leaving so much of the coloured ground of the picture to act among the shadows, and under the half tint; as is always seen in their productions. In order to do this effectually, a finished sketch ought to be prepared; and indeed, in any mode of art, such an one is very useful; particularly where the work is of any great extent.

For the great principles which guide and govern the practice of the art, see the respective articles COMPOSITION, COLOURING, DESIGN, &c. &c.

PAINTING.

A Chronological List of ancient Painters ; from the earliest Period, to the Decay of the Art under the Romans.

Names.	Country.	Time.	Excell'd in
Bularchus - -	Greece - -	700 B. C. - -	History.
Panæus - -	Athens - -	about 430 B. C. - -	History and Portraits.
Polygnotus - -	Athens - -	the same time - -	The same, and first gave character.
Timagoras - -	Athens - -	} nearly the same.	History.
Micon - -	- - - -		
Aglaophon - -	- - - -		
Cephalodorus - -	- - - -		
Phytus - -	- - - -		
Evenor - -	- - - -		
Apollodorus - -	Athens - -		soon after - -
Zeuxis - -	Heraclea - -	about 404 B. C. - -	Colour and taste.
Parrhasius - -	Ephesus - -	same time - -	Same qualities.
Timanthes - -	Samos - -	near the same time - -	Great invention and fullness of expression.
Euxenidas - -	- - - -	ditto.	
Aristides - -	- - - -	ditto.	
Pamphilus - -	Athens - -	about 340 B. C. - -	Taught Apelles ; united science to art ; and obtained great privileges of the Sicyonians ; and afterwards of all Greece, for the professors.
Eipion - -	- - - -	same time.	
Therimachus - -	- - - -	ditto.	
Apelles - -	Native of Cos - -	328 B. C. - -	In all the various parts of painting.
Pausias - -	Sicyon - -	- - - -	Encaustic.
Aristelaus - -	Son of Pausias - -	- - - -	History.
Protogenes - -	Rhodes - -	the same time - -	Taste and finish.
Aclepiodorus - -	- - - -	ditto - -	Proportion.
Amphion - -	- - - -	ditto - -	Arrangement.
Aristides - -	Thebes - -	somewhat later - -	Expression.
Nicomachus - -	- - - -	- - - -	History and poetical subjects.
Philoxenus - -	Eretria - -	- - - -	History.
Perfeus.	- - - -	- - - -	
Fabius - -	Rome - -	about 300 B. C.	
Aristippus and } Niceros }	Sons of Aristides - -	- - - -	Poetic subjects.
Antonides and } Euphranor }	Pupils of Aristippus.	- - - -	
Pyreicus - -	- - - -	later - -	Called Rhyparographus, because he painted low or vulgar subjects.
Serapion - -	- - - -	- - - -	Vulgar subjects on a large scale.
Lyfippus - -	Egina - -	- - - -	Encaustic.
Antidotus - -	Pupil of Euphranor.	- - - -	
Nicias - -	Athens, pupil to Antidotus	one of the same name, lived at the time of Apelles	Portraits, History, and Poetry.
Pacuvius - -	Rome - -	150 B. C. - -	History.
Metrodorus - -	Athens - -	170 B. C.	
Timomachus - -	Byzantium - -	30 B. C.	

Pliny mentions many other names of painters, and what kind of pictures they made in the decline of art ; but does not specify at what time they lived. See lib. xxxv. cap. 11. ver. 1.

PAINTING.

A Chronological List of Painters, from the Revival of the Art, to the Beginning of the last Century.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age.	Principal Works are at
Giovanni Cimabue	certain Greeks	first revived painting	History	Florence, Flor. 1300	60	almost all perished.
Andrea Taffi	Apollonius, a Greek	revived Mosaic	History	Florence 1294	81	unknown.
Giotto	Cimabue	quitted the stiff manner of the Greeks	History	Florence 1336	60	Rome, St. Peter's, Arezzo—Mosaics. Assisi.
Buonamico Buffalmacco	Andrea Taffi	-	History	Florence 1340	78	Pisa, Campo-Santo.
Ambrogio Lorenzetti	Giotto	-	History	Sienna 1350	83	
Pietro Cavallini	Giotto	-	History	Rome 1364	85	Rome, St. Paolo furor della Citta.
Simon Memmi	Giotto	-	Portraits	Sienna, Florence 1345	60	
Andrea Orgagna	imitated Giotto	-	History	Florence 1389	60	Florence, the Dome.
Tomaso Giottino	imitated Giotto	-	History	Florence 1356	32	
Paolo Uccello	Antonio Venetiano	first who studied perspective	Birds, some Hist.	Florence 1432	83	
Maffolino	Lorenzo Ghiberti and Gher. Starnina	gave more grace to his figures and drapery	History	Florence 1418	37	
Mafaccio	Maffolino	-	History	Florence 1443	24	Florence.
Fra. Giov. Angelico da Fiefole	Giottino	-	Hist. Miniatures	Florence, Rome 1455	68	Florence, the Palace, in the apartments of, the old pictures.
Antonella da Messina	John Van Eyck	introduced oil-painting into Italy	History	Messina 1475	49	
Fra. Filippo Lippi	Mafaccio	began to paint figures larger than life	History	Florence, Rome 1488	69	Florence, the Palace.
Andrea del Castagno, detto Degl' Impiccati	Domenico Venetiano	painted in oil first at Florence	History	Florence 1480	71	
Gentile del Fabriano	Giovanni da Fiefole	-	History	Verona 1412	80	Rome, S. Giov. Laterano, S. Mar. Maggiore.
Giacomo Bellini	Gentile del Fabriano	-	History	Venice 1470	-	
Gentile Bellini	Giacomo their father	-	History	Venice 1501	80	Venice, in some cabinets.
Giovanni Bellini		-	History	Venice 1512	90	
Cosmo Rosselli	-	-	History	Florence, Rome 1484	68	Rome, Capella Sistina.
Domenico Ghirlandaio	Alessand. Baldovineti	lively colouring, genteel designing, and good airs	History	Florence 1493	44	Florence, Palace, Closet of Madama.
Andrea Verocchio	Giacomo Squarcione	observation of perspective	History	Florence 1488	56	
Andrea Mantegna	-	-	History	Padua, Mantua 1517	66	Florence, Rome, apartments of Innocent VIII. at the Belvedere chapel.
Filippo Lippi	Fra. Filippo his father, and Sandro Boticelli	-	History	Florence 1505	69	
Pietro Perugino	Andrea Verocchio	-	History	Perugia, Rome 1524	78	Rome, Pal. Borghese, &c.
Bernardino Pinturicchio	Pietro Perugino	-	History	Florence, Sienna 1513	59	Sienna, library of the Dome, Rome, Santa Croce in Gierusalemme; Madonna dell Popolo, &c.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Aged.	Principal Works are at
Francesco Francia	Marco Zoppo	first considerable master of the Bolognese school	History	Bologna 1518	68	Bologna, in several churches.
Bartolomeo Ramenghi, detto Il Bagnacavallo	Francesco Francia	soft and fleshy colouring	History	Bologna 1541	48	Bologna.
Innocenzo Francuzzi, detto da Imola	Francesco Francia	correct drawing	History	Bologna	—	Bologna.
Francesco Turbido, detto Il Mauro	Giorgione	- - -	Portraits	Verona 1521	81	
Luca Signorelli	Pietro della Francesca	- - -	History	Cortona 1521	82	
Lionardo da Vinci	- - -	exquisite designing	Hist. and Portraits	Milan, Paris 1517	75	Milan, the Dominicans, the Academy; Florence, Pal. Pitti; Rome, Pal. Borghese, Barberini.
Giorgio Giorgione	imitated Lionardo's manner	management of the clair-obscure, and colouring	Hist. and Portraits	Castle Franco nel Trevigiano, Venice, 1511	33	Venice; Florence, Pal. Pitti; Rome, Pal. Pamphili.
Antonio da Correggio	- - -	divine colouring and morbidezza of his flesh; angelical grace and joyous airs of his figures and clair-obscure	Hist. and Portraits	Correggio nel Reggiano 1534	40	Modena, the Duke's Collections; Parma, the Dome, Saint Antonio abbate, S. Giovanni del Monte, san Sepulcro; Florence, the Palace; Paris, the Palais Royal, &c. Naples, the King's Collections. Dresden.
Mariotto Albertinelli	Cofmo Roselli	- - -	History	Florence 1520	45	
Baccio, detto Fra. Bartolomeo di S. Marco	Cofmo Roselli	grandeur of style in draperies	History	Florence 1517	48	
Pietro di Cosimo	Cofmo Roselli	- - -	Grotesq. and monst.	Florence 1521	80	
Raphaelino del Garbo	Filippo Lippi	- - -	History	Florence 1529	58	
Michael Angelo Buonarotta	Dominico Ghirlandai	great correctness of design, grand & terrible subjects, profound knowledge of the anatomical part	History	Chiusi, presso d' Arezzo; Rome 1564	90	Rome, Capella, Sistina, Capella Paulina, S. Giovanni Laterano; Florence, the Palace.
Raffaelle Sanzio d' Urbino	Pietro Perugino: corrected his manner upon seeing the works of Lionardo da Vinci and Michael Angelo	in every part of painting, but chiefly in the thought, composition, expression, and drawing	Hist. and Portraits	Urbino, Rome 1520	37	Rome, the Vatican, S. Pietro, in Montorio; S. Agustino, the Lungara, &c.; Florence, the Palace; France, Versailles, the Palais Royal; England, Hampton-Court; Naples, the King's Collection.
Titiano Vecelli	Giovanni Bellini and Giorgione	the clair-obscure & all the beauties of colouring	Hist. and Portraits	Cadore nel Friulése; Venice 1576	99	Venice; Rome, in many Collections; Spain; England, &c.
Domenico Puligo	Domenico Ghirlandai	- - -	History	Florence 1525	52	
Timoteo Urbino	Rafaëlle	the same as his master	History	Urbino 1524	54	Rome, Madonna della Pace.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age	Principal Works are at
Vicenzo da S. u Geminiano	Rafaëlle	-	History	S. Geminiano	52	Rome, the Vatican.
Lorenzo di Credi	Andrea Verocchchio, imitated Lionardo da Vinci	-	History	Florence	1527 1530	
Balthazar Peruzzi	-	-	History, buildings	Sienna, Rome	55	Rome, Madonna della Pace.
Giovanni Francesco Penni, detto il Fattore	Rafaëlle	good imitation of his master, and great dispatch	History	Rome, Naples	40	Rome, the Vatican; Lungara.
Giulio Romano	Rafaëlle	in poetic imagery	History	Rome, Mantua	54	Rome, Vatican, &c. Mantua, the Palace Té.
Peligrino di Modena	Rafaëlle	-	History	Modena	1538	
Pierino Buonacorvi, detto Ferin del Vago	Rafaëlle	-	History	Florence, Rome	47	Rome, Vatican; Genoa, Pal. Doria.
Giovanni da Udina	Rafaëlle	animals, flowers, and fruits	Grotescq.	Udina, Rome	70	Rome, Vatican, &c.
Andrea del Sarto	Pietro di Cosimo	natural and graceful airs, and correct drawing; a bright manner of colouring	History Port.	Florence	1564 1530	42 Florence, the Palace, Monasterio dé Scalzi, &c.; Rome, Pal. Borghese, &c.; Naples, King's Collection.
Francia Bigio	Mariotto Albertinelli	painting in company with and like Andrea	History	Florence	—	41
Sebastiano, detto Frat del Piombo	Giov. Bellini; Il Giorgione, M. Angelo	painting in the strong and correct manner of this last, and coloured better	History Portr.	Venice, Rome	62	Rome, S. Pietro in Montorio, Cap. Chigi; France, Palais Royal.
Orazio Sammachini	Il Bagnacavallo, Innocenzo d'Imola	-	History	Bologna	1577	45
Lorenzetto Sabattini	the fame	-	History	Bologna	—	—
Prospero Fontana	the fame	-	Hif. Por.	Bologna	—	—
Lavinia Fontana	Prospero her father	-	Hif. Por.	Bologna	1602	50
Pelegrino Tibaldi	Il Bagnacavallo, Innocenzo d'Imola	a strong Michael Angelo manner	History	Bologna, Milan	70	Bologna, the Academy; Spain, the Escorial.
Primaticcio, detto il Bologna	the fame; Julio Romano	gentleness and vivacity of imagination	History	Bologna, France	80	Fontainebleau; Chateau de Beauregard près de Biois.
Nicolo Bolognese, detto Messer Nicolo	Primaticcio	skilful execution	History	Modena	1372	60 Fontainebleau.
Il Dozzo	Lorenzo Costa, Tizian	-	History landsc.	Ferrara, Ferrara	—	—
Bernazzano da Milano	-	-	Animals, landsc. & fruits	Milan	1550	—
Giovanni Martino da Udina	Giov. Bellini	-	History	Udina, Venice	70	
Pelegrino da san Daniello	the fame	-	History	Venice	—	—
Giovanni Antonio Regillo, detto Licinio da Pordenone	Giorgione	fine colouring	History Portraits	Pordenone nel Friuli, Venice	56	Venice.
Girolamo da Trevigi	-	-	History buildings	Il Truigiano, Engl.	36	
Polidoro da Caravaggio	Rafaëlle	the correctness of design and imitation of the antique chiefly in chiaro-scuro	History	Caravaggio, Messina	51	Rome, Pal. Barberini, Masehera d'Oro, Casa di Belloni.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age.	Principal Works are at
Il Maturino	Rafaëlle	the same; they always painted together	History	Florence 1527	37	
Francesco Mazzuolo, detto Il Parmegiano	imitated Rafaëlle	great delicacy and genteelness of drawing	History	Parma 1540	36	Parma, the Dome, Madonna della Steccata; in many collections.
Girolamo Mezzuoli	Francesco, his cousin	whom he always imitated	History	Parma	—	Parma, San Sepolero.
Giacomo Palma, detto Il Vecchio	Titian and others	warm and mellow tints	Hif. Por.	Venice 1596	48	Venice, and in several collections.
Lorenzo Lotto	imitated Bellini and Giorgione	-	Hif. Por.	Venice 1544	36	
Francesco Monsignori	Bellini	-	Portraits	Venice 1519	64	
Domenico Beccafumio Meccarino	imitated Pietro Perugino	-	History	Sienna 1549	65	Sienna, Pavement of the Dome.
Giacomo Pontormo	Lionardo da Vinci, Albertinelli; Andrea del Sarto	-	History	Florence 1558	65	Florence.
Girolamo Genga	Pietro Perugino	-	History	Urbino 1551	75	
Giov. Antonio da Verzelli, detto Il Sodoma	-	-	History	Sienna 1554	—	
Bastiano Aristotile	-	-	History	Florence 1551	70	
Benvenuto Garofalo	Baldini, Lorenzo Costa	like Rafaëlle	History	Ferrara 1559	78	In a few collections.
Girolamo da Carpi	Garofalo, he imitated Correggio	-	History	Ferrara 1556	55	
Giov. Francesco Bezzi, detto Il Nofadella	Pelegriano Tibaldi	-	History	Bologna 1571	—	Bologna.
Ercole Procaccini	the same	-	History	Bologna	—	
Bartolomeo & Paffetti & tre figli	the same	-	History	Bologna	—	
Francesco Salviati	Andrea del Sarto	-	History	Florence 1563	54	Florence.
Giorgio Vasari	the same	-	Hif. Por.	Florence 1584	68	Rome, Santa Croce; Florence, the Palace.
Daniel Ricciarelli, detto da Volterra	Il Sodoma; Baldassar Peruzzi	in completion of character	History	Volterra 1566	57	Rome, S. Trinita del Monte, S. Agostino.
Taddeo Zuccherò	studied Rafaëlle	-	Hif. Por.	St. Angelo in Vado, nell'Urbino Rome 1566	37	Rome, the Caprarola, Palazzo Farnefe.
Frederico Zuccherò	-	painted with his brother	Hif. Por.	Rome 1609	66	Rome, several collections.
Bartolomeo Cefi	Il Nofadella	-	History	Bologna	79	
Dionigi Calvart	Prospero Fontana	-	History	Antwerp, Bologna 1619	54	
John of Bruges	Hubert Van Eyck	said to have invented oil-painting	Hif. Por.	Venlo in Guelders, Bruges 1470	—	Ghent, the cathedral.
Albert Durer	Hupfe Martin	-	Hif. Por.	Nuremberg 1528	57	In many collections.
Quintin Matfys, called the Smith of Antwerp	-	Nature, high finishing	Hif. Por.	Antwerp 1529	69	Antwerp, the cathedral; England, in collections.
Lucas Jacob, called Luca d'Ollanda	Cornelius Engelbert	-	Hif. Por.	Leyden 1533	—	Leyden, Hôtel de Ville, many collections.
Peter Brueghel, called Old Brueghel	Peter Koëck	-	-	Brueghel near Breda 1570	60	
John Holben, called Hans Holben	-	great Nature, extreme finishing	Hif. Por.	Basil, London 1444	46	Basil, Hôtel de Ville; England in many collections.
Roger Vandensfyde	John Van Eyck	-	History	Bruges	—	Brussels, Hôtel de Ville.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Aged	Principal Works are at
John Schorel -	Jacob Cornil -	-	History	Alcmaer, Utrecht	67	
Matthias Cock -	-	-	Landsc.	Antwerp	1562 65	
Martin Heemskirke -	John Schorel	-	Droll figures	Heemskirke, Haerlem	1574 76	
François Floris, called Franc-Flore	Lambart de Liege	-	History	Antwerp	1570 50	
Francesco Vecelli	Titian, his brother	-	Portraits	Venice	— —	
Orazio Vecelli	Titian, his father	-	Por. Hif.	Venice	1579 66	
Nadalino di Marano	Titian	colour	Portraits	Murano, Venice	— —	
Damiano Mazza	Titian	-	Hif. Por.	Padua	— —	
Girolamo di Titiano	Titian	-	Hif. Por.	Venice	— —	
Paris Bordone	Titian	colour	Hif. Por.	Venice	1588 75	
Andrea Schiavone	Titian	-	History	Sebenico, Venice	1582 60	
Alessandro Bonvincino, detto, Il Moretto	Titian, imitated Raffaëlle	-	History	Brescia	1564 50	
Girolamo Romanino	Titian	-	History	Brescia	1567 63	
Il Muttano	Titian, Tad. Zuccherero	-	Landf. Portraits	Brescia, Rome	1590 62	
Pirro Ligorio	Giulio Romano	-	Antique monuments and buildings	Naples	1573 80	
Dom. Giulio Clovio	Giulio Romano	chaste and genteel colouring, somewhat of M. Ang. in the drawing	Miniature, History	Sclavonia, Rome	1578 80	Rome, Vatican Library Florence, the Palace; Naples, King's Collection.
Il Bronzino, Angelo-Allori	Giacomo Pontormo	-	Hif. Por.	Florence	1580 69	
Alessandro Allori	Bronzino, his uncle	-	History	Florence	1607 72	
Giacomo Sementi	Dionigi Calvart	-	History	Florence	1625 45	
Marcello Venusto	Perin del Vaga	-	History	Mantua	1576 61	
Marco da Faënza	-	-	History	Faënza	— —	
Girolamo da Sermonetta	Perin del Vaga	-	History	Sermonetta	1550 46	
Battista Naldino	Il Bronzino	-	History	Florence	— —	
Nicolo del Pomerancio	-	-	History	Pomerancio	1626 74	
Jean Coufin	-	commonly upon glafs	History	Soucy près de Sens; Paris	1589 —	Vincennes, the Minims; Paris.
Michael Coxis	Van Orlay, Raffaëlle	-	History	Mechlin, Antwerp	1592 95	
John Bol	-	-	Miniature Landsc.	Mechlin, Brussels	1593 59	
Peter Porbus	-	-	-	Bruges	1583 73	
Antony More	John Schorel	-	Por. Hif.	Utrecht	1575 56	
George Hoefnaghel	-	-	Views of cities landsc.	Antwerp	1600 —	
Camillo Procaccini	Ercole, his father; Prospero Fontana	a dark, strong, expressive manner	History	Bologna, Milan	1626 80	Milan; Genoa, the Annonciate St. Maria Carignano.
Giulio Cesare Procaccini	Ercole, his father; Prospero Fontana	a dark, strong, expressive manner	History	Bologna, Milan	1626 78	Milan; Genoa, the Annonciate St. Maria Carignano.
Jude Indocus Van-Winghen	studied in Italy	-	History	Brussels, Germany	1603 62	

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age at Death.	Principal Works are at
John Strada -	studied in Italy -	- - -	Battles, hunting History	Bruges, Florence 1604	68	
Bartholomew Spranger	- - -	- - -	History	Antw. Vienna 1623	77	
Michael John Miervelt	Ant. Blockland -	- - -	Portraits	Delft 1641	73	
Paolo Cagliari, detto Paul Veronese	Antonio Badiglio -	rich and noble composition; fine warm colouring	History, Portraits	Verona, Venice 1588	58	Venice, and almost every where.
Carlo Cagliari -	Paolo, his father -	imitated his manner	the same	Venice 1596	26	
Benedetto Cagliari	the same -	the same -	the same	the same 1598	60	
Gabrielle Cagliari	the same -	the same -	the same	the same 1631	63	
Battista Zelotti -	Antonio Badiglio, worked with Paul Veronese	- - -	History, chiefly in Fresco	Venice 1592	60	
Giacomo da Ponte, detto Il Bassano	Francesco, his father, Bonifacio Venetiano, imitated Titian	much nature, and fine colouring	Rustic Figures, Animals, Por. Hif.	Vicenza 1592	82	Venice, &c.
Francesco Bassano	Giacomo, his father	imitated his manner, and copied his pictures	the same	Venice 1594	84	
Leandro Bassano	the same -	the same -	the same	Venice 1623	65	
Giambattista Bassano	the same -	the same -	the same	Venice 1613	60	
Girolamo Bassano	the same -	the same -	the same	Venice 1622	62	
Giacomo Robulti, detto Il Tintoretto	Titian, in his drawing imitated Michael Angelo -	the boldness and softness of his pencil; variety and correctness of design; seldom finished neatly	History, Portraits	Venice 1594	82	Venice, and every where
Marietto Tintoretto	Tintoret, her father	- - -	Portraits	Venice 1590	30	
Paul Franceschi	Tintoret -	- - -	Landsc.	— 1596	56	
Martin de Vos -	Tintoret -	- - -	Landsc.	Germany 1604	84	
John Rothenamer	Tintoret -	designed after his manner	History	Munich 1606	42	
Paolo Farinato -	Antonio Badiglio -	- - -	History	Verona 1606	84	Verona.
Marco Vecelli -	Titian, his uncle -	- - -	-	Venice 1611	66	
Livio Agresti -	Perin del Vago -	- - -	History	Forli 1580	—	
Marco da Siena	Dan. Volterra -	- - -	History	Sienna 1567	57	
Giacomo Rocca	Dan. Volterra -	- - -	History	Rome —	—	
Frederico Barocci	studied Raffaëlle	fine genteel drawing	Hif. Por.	Urbino, Rome 1612	84	
Il Cavaliero Francesco Vanni	Fred. Baroccio	correct design and agreeable colouring	History	Sienna, Rome 1615	51	Sienna; Rome, St. Peters; Genoa, Santa Maria in Carignano.
Michael Angelo Amerigi, detto, Il Caravaggi	Cav. Apino -	a strong and close imitation of nature, but without choice; exquisite colouring	History, humourous figures	Caravaggio in Lombardy, Rome 1609	40	Rome. Pal. Barberini; several collections.
Lodovico Caracci	Prospero Fontano -	exquisite design; noble and proper composition; strong and harmonious colouring	History	Bologna 1619	64	Modena, Pal Ducale; Bologna S Michel in Botco, S. Giorgio, La Certosa, &c.

PAINING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	$\frac{75}{2}$	Principal Works are at
Agoſtino Caracci	Ludovico, his couſin	ſimilarly accom- pliſhed	Hiſtory, Portraits, Landſc.	Bologna, Parma 1602	44	Parma, Villa Ducale; Bologna, Pal. Magani, La Certofa.
Annibale Caracci	Ludovico, his couſin	ſimilarly accom- pliſhed	Hiſtory, Portraits, Landſc.	Bologna, Rome 1609	49	Rome, Pal. Farneſe, &c. Bologna, S. Giorgio, &c. ſeveral collections.
Domenico Zampieri, detto, Il Domeni- chino	the Caracci	correct deſign, ſtrong & mov- ing expreſſion	Hiſtory, Portraits	Bologna, Naples 1641	60	Rome, S. Girolamo della Carita, Santa Maria Traſtavere, S. Andrea della Valle, S. Andrea in Monte Celio, Grot- ta Ferrata, Pal. Ludo- viſio; S. Peter's, S. Carlo a Catinari, S. Silveltro, &c.
Guido Reni	Dionigi Calvart, the Caracci	divine and grace- ful airs and atti- tudes, gay and lightſome col- ouring	Hiſtory, Portraits	Bologna 1642	68	Rome, Pal. Roſpiglioli, Pal. Spada, Capucini, S. Andrea della Valla, &c. Bologna, Mendi- canti, S. Domenico, S. Michel in Boſco; and in many collec- tions.
Cav. Giov. Lanfranco	the Caracci	great force, and <i>fulgore</i> , chiefly in treſco	Hiſtory	Parma, Naples 1647	66	Rome, S. Andrea della Valle; Naples, S. Carlo de Catinari; La Capella del Te- foro.
Francesco Albani	Dionigi Calvart, the Caracci	genteel poetical fancy, beautiful airy colouring; his nymphs and boys are moſt admired	Hiſtory	Bologna 1660	82	The Duke of Modena's and many other cabi- nets.
Lucio Maſſari	the Caracci	-	Hiſtory	Bologna 1633	64	Bologna, S. Michel in Boſco.
Sisto Badalocchio	Annibal Caracci	-	Hiſtory	Parma	-	Rome, Pal. Verofpi.
Antonio Caracci	Annibal, his uncle	-	Hiſtory	Bologna, Rome 1618	35	Rome, S. Bartolomeo nell Ifola.
Giuſeppe Pini, detto, Cavalier Arpino	Raffaella da Rheggio	the vivacity and force of his compoſition	Hiſtory	Arpino, Rome 1640	80	Rome, the Capitol, &c.
Il Paduano	-	-	Portraits	Padua	-	-
Il Cigoli	Andrea del Sarto	-	Hiſtory	Florence 1613	54	-
Domenico Feri	Cigoli	-	Hiſtory	Rome 1624	35	-
Cherubino Alberti	-	-	Hiſtory	Rome 1615	63	-
Cavaliere Paſſignano	Frederic Zucchero	-	Hiſtory	Florence 1638	80	Florence, the Dome.
Orazio Gentileſchi	Aurelio Lomi	-	Hiſtory	Piſa 1647	84	-
Filippo d'Angeli, det- to, Il Napolitano	-	-	Landſc.	Rome, Naples 1640	40	-
Paul Brill	after Titian and An- nibale	-	Landſc.	Antwerp, Rome 1626	72	Rome, Vatican, Pal. Borghefe, many col- lections.
Matthew Brill	-	worked with Paul, his brother	Landſc.	Antwerp, Rome 1584	34	-
Pietro Paolo Gobbo	-	-	Fruit, Landſc.	Cortona 1640	60	-
Il Viola	Annibal Caracci	-	Landſc.	Rome 1622	50	Rome, Vigna Montalta, Vigna Aldobrandina, Vigna pia.
Roland Saveri	imitated Paul Brill	much finiſhing, but dry	Landſc.	- 1639	63	-

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age.	Principal Works are at
Bartolomeo Manfredi	M. Angelo Caravaggio	- -	History	Mantua	—	
Carlo Saracino	imitated Caravaggio	- -	History	Venice	1625 40	
Il Velentino	M. Angelo Caravaggio	- -	History	France	1632 32	
Giuseppe Ribera, detto, Lo Spagnuolo	M. Angelo Caravaggio	a dark strong manner; dismal and cruel subjects	History	Valencia	1656 67	Naples, &c. many collections.
John Mompre	studied nature	- -	Landscape	Antwerp	—	
Henry Cornelius Wroon, or Vroon	Corn. Henrickson	- -	Sea-ports, Ships,	Haerlem, Rome	—	
Agostino Tassi	Paul Brill	- -	Ships, Tempests, Landscapes, Fruit, Perspective	Bologna	—	Genoa; Leghorn; on the outsidcs of houses.
Fra. Matteo Zaccolino	- -	- -	Perspective	Rome	1630 40	Rome, St. Silvestro.
Antonio Tempesta	John Strada	freedom of style	Animals, Battles, Huntings	Florence	1630 75	Florence, &c.
Octavius Van Veen, called Otho Vænius	- -	- -	History	Leyden	1634 78	
Jean Le Clerc	Carlo Saracino	- -	History	Nancy	1633 —	Nancy, Les Jcsuits.
Simon Vouet	Laurent, his father	- -	Hif. Por.	Paris; Paris	1641 59	Paris, in many churches.
Peter Noefs	Henry Steinwick	- -	Perfec.	Antwerp	1651 85	
Henry Steinwick	John De Vries	neatness	Buildings places illuminated by fire and candles	Steinwick	1603 53	
Theodore Rombouts	Abraham Janfens	- -	Low life	Antwerp	1640 43	
Gerard Segres	Abraham Janfens	imitated M. A. Caravaggio	- -	Antwerp	1651 62	
Sir Peter Paul Rubens	Otho Vænius	admirable colouring; great magnificence & harmony of composition: a gay and lightsome manner	History, Portraits Landfc.	Antwerp	1641 63	Flanders, Holland, &c. Dusseldorp; the Elector Palatine's Collec. France, Palais Luxembourg, &c. England, Whitehall, &c. Genoa, St. Ambrosio, &c.
Sir Antony Vandyck	Rubens	his master's excellencies with more grace and correctness	Portraits History	Antwerp London	1641 42	Genoa, Pal. Durazzo, &c. Flanders, Holland, &c. France, Versailles, &c. England, the Pembroke and Walpole Collections, &c.
Rembrandt	- -	great knowledge and execution of the clair-obscur; high finishing, sometimes a very bold pencil and distinct colouring; vast nature	History Portraits Low life	— -	1674 68	France, King's and Monsieur's Collections, &c. &c. Florence, the Palace, Amsterdam, &c.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age at Death.	Principal Works are at
Cornelius Polembourg	Abraham Bloemart	high finish -	Miniature Landsc. with figures	Utrecht 1660	74	Many cabinets.
John Brueghel, called Velvet Brueghel	Old Brueghel, his father -	extreme neatness and finishing	Little Landsc. with figures, animals and flowers	Brussels 1625	65	
Moses, called the Little	Corn. Polembourg	-	Small Landsc. with figures	— 1650	—	
F. Dan Legres	Young Brueghel -	-	Flowers	Antwerp 1666	70	
Gaspar Craes	Coxis -	-	-	Brussels 1669	84	
Bartholomew Briemberg	studied at Rome -	-	Landsc.	— 1660	40	
John Affelyn, called Little John	Esaïas Vander Velde	-	Landsc.	— 1660	50	
Francis Snyders	— painted with Rubens	great execution	Animals dead & alive	Antwerp 1657	78	
Ert Vceft	- -	-	Sea-fights	Brussels 1670	—	
Lewis Confijn	- -	-	Tempets	— 1670	—	
Philip Vauvremans	John Wynants -	-	-	Haerlem 1668	48	
Gerard Dow	Rembrandt -	-	Little figures	Leyden 1474	61	
Pietro Francesco Mola	Albani, Cav. Arpino	strong painting	History	Como; Rome 1666	56	Rome, Monte Cavallo; Pal. Costaguti, &c.
Giov. Battista Mola	Albani -	the same	History Landsc.	—	—	
Giacomo Cavedone	Ludov. Caracci -	-	History	Bologna 1660	80	Bologna, St. Michael in Bosco, &c.
Agostino Metelli	- -	-	Buildings Perspective	Bologna; Spain 1660	51	Bologna, &c.
Angelo Michael Colona	Ferrantino -	-	Buildings History	Bologna 1687	87	Bologna, &c.
Giov. Benedetto Castiglione, detto, Il Genovese	Paggi, Vandyke -	-	-	Genoa —	—	
Pietro Testa	Domenichino -	capricious and strange designs	History Whims	Lucca 1650	39	
Matthew Platten, called Il Montagna	Affelyn -	-	Sea-pieces	Antw. Ven. —	—	
Francesco Barbieri, detto, Il Guercino da Cento	the Caracci -	a medium between the Caracci and Caravaggio, he has two manners, one a dark and strong one; the other more gay and gracious	History	Cento nel Bologna; Bologna 1667	76	Rome, Vigna, Ludovisi, St. Peter's; Grotto Ferrata.
Pietro Berrettini, detto Pietro da Cortona	Baccio Ciampi -	noble compositions; bright and beautiful colouring	History	Corunna; Rome 1669	73	Rome, Pal. Barberini Pal. Pamfili, Chiesa nuova, St Peter's, St. Agnes; Florence, Pal. Pitti, &c.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age.	Principal Works are at
Antonino Barbalonga	Domenichino	- - -	History	Messina	—	Rome, St. Andrea della Valle Chiesa, dei Theatini, &c.
Andrea Camaceo	Domenichino	- - -	History	Bevagna; Rome	55	Rome, St. Peter's, St. Giov. in Laterano, Pal. Palastrina, &c.
Andrea Sacchi	Albani	a colouring more languid than Pietro Cortona, but extreme delicate and pleasing	History	Rome; Rome	72	Rome, Pal. Barberini, &c. Chiesa, di St. Romualdo, St. Carlo di Catinari, &c.
Simone Cantarini	Guido	- - -	History	Pesaro; Bologna	36	
Cav. Carlo Cignani	Albani	noble, bold manner and bright colouring	History	Bologna; Bologna	91	Bologna, Pal. Davia, Certoso, &c.
Pietro Facini	Annibal Caracci	- - -	History	Bologna	1602	Bologna, &c.
Giov. Andrea Donducci detto Il Mastelletta	the Caracci	- - -	History	Bologna	1655	Bologna, &c.
Alessandro Tiarini	Prospero Fontana	- - -	History	Bologna	1668	Bologna, &c.
Leonello Spado	the Caracci	- - -	History	Bologna	1622	Bologna, &c.
Giov. Andrea Sirani	Guido	- - -	History	Bologna	1670	Bologna &c.
Elisabetta Sirani	Andrea, her father	- - -	Hist. Por.	Bologna	1664	Bologna, &c.
Giacomo Sementi	Guido	- - -	History	Bologna	1625	Bologna, &c.
Francesco Geffi	Guido	good imitation of his master	History	Bologna	—	Bologna, &c.
Lorenzo Garbieri	Lo'd. Caracci	- - -	History	Bologna	1654	Bologna, &c.
G. Francesco Romanelli	Pietro Cortona	- - -	History	Viterbo; Rome	45	France, &c. Rome, &c.
Diego Valasquez	Francesco Pacheco	great fire & force	Portraits	Spain	1660	Rome, Pal. Pamfili; France. Louvre.
Alessandro Veronese	Felice Riccio	a weak but agreeable manner	History	Verona	1677	France, Versailles, &c.
Mario de Fiori	- - -	- - -	Flowers	Rome	1656	—
Michelangelo del Campidoglio	Fioravante	- - -	Flowers & Fruits	Rome	1670	60
Salvator Rosa	Spagnuletto and Daniel Falcone	savage and uncouth places; very great and noble style; stories that have something of horror or cruelty	Landsc. History	Naples; Rome	59	Rome, Pal. Palavicini; Paris, the King's Collection, &c.
Il Cav. Calabrese	Guercino	- - -	History	Calabria	1688	86 Rome, St. Andrea della Valle, &c.
Fer. amola Fioventi	- - -	- - -	Vases, instruments, carpets, and still-life	Brescia	1512	—
Il Maltese	- - -	- - -	the same	—	—	—
Claudee Gelee, called Claude Lorraine	Godfrey Wals; Agostino Taffi	rural and pleasing scenes, with various accidents of Nature, as gleams of sunshine, the rising moon, &c.	Landsc.	Toul; Rome	82	Rome, Pal. Chigi, Altieri, Colonna; many Collections.

PAINTING.

Names.	Studied under	Excelled in	Painted	Country, Place, and Year of their Death.	Age at Death	Principal Works are at
Nicholas Pouffin	Quintin Varin	exquisite knowledge of the antique; fine expression; skilful and well-chosen composition and design. Scenes of the country with ancient buildings and historic figures intermixed	History Landsc.	Andilly; Rome 1665	71	France, Versailles, Palais Royal, &c. Rome, Cav. Pozzo's collection, and in many more elsewhere.
Gaspar du Ghet, called Gasp. Pouffin	Nicholas his brother-in-law	a mixture of Nicholas & Claude Lorraine's style	Landsc.	Rome 1665	—	Rome; Paris, &c.
Eustache Le Seur	Simon Vouet	simplicity, dignity, and correctness of style, he is called the French Raphael	History	Paris 1665	38	Paris, the Chartreuse and Hotel in the Isle Notre Dame, &c.
Michelangelo delle Battaglie	Mozzo of Antwerp	- -	Battles	- -	- -	- -
Jacques Stella	his father	— painted upon marble frequently	History Min.	Lyons; Paris 1647	51	Lyons; Paris, &c.
Carlo Maratti	Andrea Sacchi	- -	History	Ancona; Rome 1713	88	Rome; many churches and palaces, &c.
Luca Giordano	Lo Spagnuolo	- -	History	Naples 1705	76	- -
Charles Le Brun	Simon Vouet; Nicholas Pouffin	- -	History	Paris 1690	71	Versailles.
Cav. Giacinto Brandi	Lanfranco	- -	History	Poli; Rome 1713	90	Rome, &c.
Ciro Ferri	Pietro Cortona	- -	History	Rome 1689	55	Rome, St. Agnes, Pal. Monte Cavallo, St. Ambroio, &c. Florence, Pal. Pitti.

PAINTING, *Economical*, is that application of artificial colours, compounded either with oils, or water, which is employed in preserving or embellishing houses, ships, furniture, &c. &c. The term, *economical*, applies more immediately to the power which oil and varnishes possess, of preventing the action of the atmosphere upon wood, iron, and stucco, by interposing an artificial surface; but it is here intended to use the term more generally, in allusion to the decorative part, as applied to buildings; as well as to its more essential ones; and as it is employed by the architect, throughout every part of his work, both externally and internally.

In every branch of painting in oil, as applicable either to churches, theatres, houses, or any other public or private buildings, or edifices, the general process will be found very similar; or with such variations, as will easily be suggested by the judicious artist, or workman.

The first coatings, or layers, if on wood or iron, ought always to be of ceruse or white lead; the very best that can be obtained; which should have been previously ground very fine in nut or linseed oil, either over a stone with a muller, or, as that mode is too tedious for large quantities, it may be passed through a mill. If used on wood, as shutters, doors, or wainscoting made of fir or deal, it is highly requisite to destroy the effects of the knots; which

are generally so completely saturated with turpentine, as to render it, perhaps, one of the most difficult processes in the business to conquer. The best mode in common cases, is to pass over the knots with ceruse ground in water; bound by a size made of parchment, or some other animal substance. When that is dry, paint the knots with white lead ground in oil, to which add some powerful siccativ, or dryer; as red lead, or litharge of lead, about one-fourth part of the latter. These preparations should be done carefully, and laid very smoothly with the grain of the wood. When the last coat is dry, which will be in twelve or twenty-four hours, then smooth it with pumice-stone, or give the work the first coat of paint, prepared, or diluted with nut or linseed oil. When that is dry, all the nail holes or other irregularities on the surface should be carefully stopped, with a composition of oil and Spanish white, a whitening commonly known by the name of putty; but which is frequently made and sold at the shops of very inferior articles. When that is done, let the work be painted over again, with the same mixture of white lead and oil, somewhat diluted with the essence of oil of turpentine, which process should be repeated not less than three or four times, if the work is intended to be left, when finished, of a plain white or stone colour; if of the latter, the last coat should have a small quantity of ivory or lamp black added, to reduce its whiteness a little; and

PAINING.

this is also of service in preserving the colour from changing : a circumstance which the oil is apt to produce. But if the work is to be finished of any other colour, either grey, green, &c. it will be requisite to provide for such colour, after the third operation, particularly if it is to be finished flat, or, as the painters style it, dead-white, grey, fawn, &c. &c. In order to finish the work flatted, or dead, (which is a mode much to be preferred for all superior works ; not only for its appearance, but also for preserving the colour, and purity of the tint,) after the work, supposing it to be wood, has been painted four times in oil colour, as directed in general cases, one coat of the flatted colour, or colour mixed up with a considerable quantity of turpentine, will be found sufficient ; although in large surfaces it will frequently be requisite to give two coats of the flatted colour to make it quite complete. Indeed, on stucco it will be almost a general rule ; but as that will be hereafter treated, we shall at present say no more concerning it.

It must be observed, that in all the foregoing operations, it will be requisite to add some sort of sicative. A very general and useful one is made by grinding in linseed, or, perhaps, prepared oils, boiled, are better, about two parts of the best white copperas, which must be well dried, with one part of litharge of lead : the quantity to be added, will much depend on the dryness, or humidity, of the atmosphere at the time of painting, as well as the local situation of the building.

It is highly proper here to observe, that there is a kind of copperas made in England, and said to be used for some purposes in medicine, that not only does not assist the operation of drying in the colours, but absolutely prevents those colours drying, which would otherwise have done so by themselves. The best dryer for all fine whites, and other delicate tints, is saccharum saturni, or sugar of lead, ground in nut oil ; but which being very active, a small quantity, about the size of a walnut, will be sufficient for twenty pounds of colours, where the basis is ceruse. It will be always worthy to be observed, that the greatest care should be taken to keep all the utensils, brushes, &c. particularly clean ; or the colours will soon become very foul, so as to destroy the surface of the work. If this should so happen, the colour should be passed through a fine sieve, or canvas ; and the surface of the work be carefully rubbed down with sand-paper, or pumice-stone ; and the latter should be prepared by being ground in water, if the paint be tender, or recently laid on.

The above may suffice as to painting on wood, either on outside or inside works ; the former being seldom finished otherways than in oil, four or five coats are generally quite sufficient.

We shall now proceed to note what is requisite for the painting of new walls or stucco, not painted before, and prepared for oil colours.

It does not appear that any painting in oil can be done to any good or serviceable effect in stucco, unless not merely the surface appear dry, but that the walls have been erected a sufficient time to permit the mass of brick-work to have acquired a sufficient degree of dryness : when stucco is on battened work, it may be painted over much sooner than when prepared as brick. Indeed, the greatest part of the mystery of painting stucco, so as to stand or wear well, certainly consists in attending to these observations ; for whoever has observed the expansive power of water, not only in congelation, but also in evaporation, must be well aware that when it meets with any foreign body obstructing its escape, as oil painting for instance, it immediately resists it ; forming a number of vesicles, or particles containing an acrid lime water, which forces off the layers of plaster, and

frequently causes large defective patches, extremely difficult to get the better of.

Perhaps in general cases, where persons are building on their own estate, or for themselves, two or three years are not too long to suffer the stucco to remain unpainted ; though frequently, in speculative works, as many weeks are scarcely allowed. Indeed there are some nostrums set forth, in favour of which it is stated, in spite of all the natural properties of bodies, that stucco may, after having been washed over with these liquids, be painted immediately with oil colours. It is true there may be instances, and in many experiments some will be found, that appear to counteract the general laws of nature ; but on following them up to their causes, it will be found otherwise.

Supposing the foregoing precautions to have been attended to, there can be no better mode adopted for priming or laying on the first coat on stucco, than by linseed or nut oil, boiled with dryers, as before mentioned, with a proper brush ; taking care, in all cases, not to lay on too much, so as to render the surface rough and irregular, and not more than the stucco will absorb. It should then be covered with three or four coats of ceruse, or white lead, prepared as described for painting on wainscoting ; letting each coat have sufficient time to dry hard. If time will permit, two or three days betwixt each layer will not be too long.

If the stucco be intended to be finished of any given tint, as grey, light green, apricot, &c. it will then be proper, about the third coat of painting, to prepare the ground for such tint, by a slight advance towards it.

Grey is made with ceruse ; Prussian blue, ivory black, and lake, sage green, pea, and sea-greens, with white ; Prussian blue and fine yellows, apricot and peach, with lake ; white, Chinese vermilion, and fine yellow, fawn colour, with burnt terra Sienna, or umber and white ; olive greens, with fine Prussian blue and Oxfordshire ochre.

Painting in distemper, or water colours mixed with size, stucco, or plaster, which is intended to be painted in oil when finished ; but not being sufficiently dry to receive the oil, may have a coating in water colours, of any given tint required, in order to give a more finished appearance to that part of the building.

Straw colours may be made with French white, a ceruse, and mallicot or Dutch pink. Greys, fine, with some whites, and refiners' verditer. An inferior grey may be made with blue-black, or bone-black, and indigo. Pea greens, with French green, Olympian green, &c. Fawn colour, with burnt terra de Sienna, or burnt umber and white : and so of any intermediate tint. The colours all should be ground very fine, and incorporated with white, and a size made of parchment, or some similar substance ; isinglass being too expensive for common works.

It will not require less than two coats of any of the foregoing colours in order to cover the plaster, and bear out with an uniform appearance. It must be recollected, that when the stucco is sufficiently dry, and it is desirous to have it painted in oil, the whole of the water colour ought to be removed ; which may be easily done by washing ; and when quite dry, proceed with it after the directions given in oil painting of stucco.

When old plastering has become discoloured by stains, and it be desired to have it painted in distemper ; it is then advisable to give the old plaster, when properly cleaned off and prepared, one coat at least of white lead ground in oil, and used with spirits of turpentine, which will generally fix all old stains ; and when quite dry, will take the water colours very kindly.

The above processes will also apply to old wainscoting,

in cases where temporary painting is only required; but cannot be recommended for durability.

PAINTLICK, in *Geography*, a town of America, in the state of Kentucky; 14 miles E.N.E. of Stamford.

PAINTLICK Creek, a river of Kentucky, which runs into the river Kentucky, N. lat. $37^{\circ}37'$. W. long. $84^{\circ}43'$.

PAINVILLE, a town of America, in Amelia county, Virginia, with a post office; 197 miles W. of Washington.

PAJOT, LEWIS LEO, *Count d'Ansembray*, in *Biography*, a French nobleman, was born at Paris in the year 1678. He received the advantages of a liberal education, and having discovered an inclination for mathematical pursuits while he was very young, he was instructed in the philosophy of Des Cartes. After this he took a tour to Holland, where he formed an acquaintance with Huygens, Ruysh, Boerhaave, and other persons distinguished by their profound knowledge in literature and the sciences. He was appointed director-general of the posts in France, and conducted the business of that department in such a manner as entitled him to the esteem of the public, and the confidence and favour of his sovereign. Upon the death of his father, the count came into possession of a country-seat at Bercy, where he determined to establish a scientific museum; and he spared neither trouble nor expence to furnish it with rarities of nature and art, and with philosophical and mechanical instruments, and machines of every description. In a short time his cabinet was enriched with a great number of curiosities, particularly in mechanics and natural history, on which account it was visited by Peter the Great, the emperor of Germany, and by other princes. It was thought to be the most valuable museum in Europe, and was unrivalled in articles connected with the science of mechanics. In the Transactions of the Academy of Sciences, of which he was a member, there are several of his papers; among which is a description of an "Instrument for the Measurement of Liquids:"—of "An Areometer, or Wind Gage:"—of a "Machine for beating regular Time in Music." He died in 1753, bequeathing his museum to the academy.

PAIR, PAR, a collective term, used for two equal or similar things ordinarily joined together; though more frequently for artificial things than for natural ones. As, a pair of gloves, of stockings, of shoes, &c.

PAIR is also used in compound things, for two parts alike to each other, though they only make one whole. As, a pair of scissors, &c.

PAIR is also used for a set or system of several things joined to make another complete: as a pair of bagpipes, &c.

PAIR, again, is used, by extension, for a thing that is single, as a pair of tables, &c.

PAIR of Nerves, in *Anatomy*, the right and left corresponding nerves, which are almost every where alike in the body. See *NERVOUS System*.

PAIRA, in *Geography*, a river of Persia, which loses itself in a lake near Tadvan, in the province of Farsistan.

PAIRAN, a town of Sibiu, one of the Philippine islands; inhabited chiefly by Chinese merchants and artificers.

PAIRUMBAUCUM, a town of Hindoostan, in the Carnatic; 30 miles W. of Madras.

PAISHAWUR, or **PEISHORE**, a city of Candahar, and capital of a district, in Cabulistan, seated on the Kameh. In 1738 this town was taken by Nadir Shah; 125 miles S.E. of Cabul. N. lat. $33^{\circ}18'$. E. long. $70^{\circ}36'$.

PAISLEY, a large town and borough of barony, in the county of Renfrew, Scotland, is situated at the distance of six miles and a half westward from the city of Glasgow, on the banks of the White-Cart river. It probably owes

its origin to an abbey, which was founded here in the year 1160. It did not, however, rise to be a place of much importance till after the union in 1707. From this period, the inhabitants began to direct their attention to manufactures, which have ever since been gradually on the increase, and have rendered Paisley at present, second only to Edinburgh and Glasgow, among the towns of North Britain. According to the parliamentary returns of 1811, it contains 2951 houses, and a population of 36,785 persons, including the two suburb parishes of Abbey, East and West.

James IV. king of Scotland, granted to Paisley the first charter, constituting it a borough, in 1488, at the intercession of George Shaw, then abbot of the monastery. Under this grant it enjoys all the privileges of a royal borough, except the right of being represented in parliament, and of sending delegates to the general convention at Edinburgh. The corporation or magistracy consists of three bailies, and seventeen counsellors, who are elected annually, besides a treasurer, town clerk, and other inferior magistrates. The bailies are invested with the full powers of justices of the peace, and take cognizance, in the first instance, of all offences committed within their jurisdiction.

At the commencement of the last century, Paisley is described as consisting only of one principal street, about half a mile in length, with a few narrow lanes branching out on either side. Now, however, it is an extensive and well built town, and contains many excellent public and private edifices, especially in that part called the New Town, which stands on the eastern bank of the Cart, and is laid out with great regularity. Over the river are three bridges, placed at convenient distances, and connecting with each other the buildings on its opposite sides, that is, the New and Old Town, with their respective suburbs. The streets are in general well paved and lighted, and exhibit all the marks of opulence and industry, some of them being crowded with warehouses and manufactories, occupied by the merchants and tradesmen. The whole town is built of stone, and in all the modern streets the houses have squared and smooth free-stone fronts, in the same manner as those of Edinburgh and Glasgow.

Paisley contains three parish churches, and several chapels of ease and dissenting meeting houses, but none of them are peculiarly remarkable as buildings, except the abbey church, which will be described in the sequel of this article. The edifices appropriated to public business, charity, or amusement, are all of modern erection. The hospital or poor-house was built in 1752, and is under the management of fifteen directors. It is a large structure, with an extensive garden attached, and is supported by a small assessment on the inhabitants at large. The town-hall is a handsome building of cut stone. The butcher market is probably the neatest and most commodious range of shambles in Great Britain. The front is of hewn stone. No public theatre has yet been erected here, but there are rooms appropriated to concerts and assemblies. A large subscription room, on the plan of the Glasgow tontine, has been erected within the last five years.

Paisley has attained its present rank and importance from its manufactures; and hence it seems proper to give a slight sketch of the rise, and of the progressive changes which these have undergone at different periods since their first establishment. At the time of the union, and for some years after, scarcely any other goods were produced here, but coarse linen checks, and a kind of striped cloth, called Bengals; and even these were manufactured only on a very limited scale. When a free trade, however, was opened with England, the spirit of manufacture began to display

itself in Paisley, with a vigour seldom paralleled. This effect resulted in a great measure from the exertions of pedlars, or, as they are called in Scotland, packmen, many of whom, having accumulated a small capital, settled in this town and its vicinity, and became resident manufacturers. The experience of what would suit the taste of the people, and the connections they had established in the course of their travelling career, presented many advantages in their new occupation, of which they did not fail to avail themselves. They first improved the quality of the linen cloths above-mentioned; but these in a few years gave way entirely to articles of a lighter and more fanciful description; such as linen gauze and lawns; both plain and ornamented. The manufacture of thread was introduced about the year 1750, and still continues to afford employment to a large portion of the inhabitants. In 1760 the manufacture of silk gauze was begun by Mr. McKerral of Hillhouse, and soon displaced the linen cloths as the staple produce of Paisley. Before that period, the patterns and designs of all fancy goods were made at Paris; but the Paisley manufacturers disdain the servility of imitation, established draughtsmen of their own, whose productions were thought not only to rival, but to excel those of the French artists. Hence such a variety of elegant and richly ornamented gauzes was issued from this town, as surpassed every thing that had hitherto appeared. Spitalfields was compelled almost to abandon the manufacture; and several companies came down from London to carry it on, on the banks of the Cart, where it flourished beyond any manufacture which any town in Scotland could boast of till the invention of Arkwright's machinery for spinning cotton, by rendering fabrics of that material both cheap and elegant, almost excluded silks from any share in female dress, when it of course declined, and is now almost abandoned. Following the tide of fashion, the manufacturers of Paisley turned their exertions into the new channel, and soon brought their cottons into competition with those of Manchester itself. The whole neighbouring waters were speedily occupied with spinning mills and bleach-fields, and many thousand persons took up the employment of weaving cottons here and in the surrounding vilages.

Besides these principal manufactures, Paisley has some others of a more local description, likewise conducted on an extensive scale; tan works, and soap and candle works are numerous, and there is also a calico printing work, a coppers work, and several manufactories for tape and ribbons.

The most important remain of antiquity in Paisley, or indeed in the county of Renfrew, is the monastery already mentioned, as having probably been the nucleus which determined the origin of the town. It was first bounded as a priory by Walter lord high steward of Scotland, and filled by him with monks of the order of Clugni; but afterwards attained the rank of an abbacy. The lands belonging to it were further erected by Robert II. into a regality under the jurisdiction of the abbot. At the reformation this abbey was secularized; and towards the close of the sixteenth century, it was constituted a temporal lordship in favour of lord Claude Hamilton, who was created lord Paisley in 1591. His son James, earl of Abercorn, afterwards sold it to the earl of Angus, by whom it was alienated, in 1653, to William, earl of Dundonald, and continued in his posterity till the year 1764, when it was repurchased by the late earl of Abercorn. The monks here are supposed to have been the authors of the "Chronicon Clugniense," or "The Black Book of Paisley," as it is usually called, from the colour of its boards. This curious monument of antiquity is a chronicle of the public affairs of Scotland during several

centuries, and is frequently quoted by Buchanan. It was long in the possession of the president Spottiswood; after his death it was carried into England by general Lambert, and was subsequently deposited in the king's library at St. James. Many additions have been made to the buildings of this abbey at different eras since its original erection. Abbot Shaw, in particular, enlarged and beautified the whole monastery, and indeed may properly be regarded as a second founder. He built the refectory and other offices necessary for the monks, the church and the precinct of the convent; and inclosed the gardens and orchards by a wall of hewn stone, which measured about a mile in circuit. This wall, observes Mr. Pennant, (*Tour in Scotland*) "is a very noble and extensive one, and indicates the ancient grandeur of the place." On a stone at the north-west corner is this very singular inscription.

"Thy call it the Abbot George of Shaw
About my Abbey gart mak this waw;
An hundred four hundredth zeir
Eighty-four the date, but weir
Pray for his salvtie
That laid this noble foundation."

All the buildings of this abbey are much dilapidated, excepting the chancel of the church, which is still entire, and has of late years been fitted up for parochial service. Judging from this member, and some additional ruins, the church appears to have been, when complete, a very grand and magnificent structure. It was in the form of a cross, but the only part of the transept standing is the great north window, the arch of which is uncommonly lofty and elegant. The chancel is separated into a middle and two side aisles, by two ranges of columns, supporting pointed arches, and having their capitals ornamented with grotesque figures. The exterior of this building displays much sculptural embellishment, especially the north and south doors.

Near the abbey church is an old chapel, which is appropriated as the burying place of the Abercorn family. It is remarkable for its echo, which is probably the finest in Europe, as its effects are said to surpass those of the whispering gallery at St. Paul's. "When the end door (the only one it has) is shut, the noise is equal to a loud and not very distant clap of thunder; if you strike a single note of music, you hear the sound gradually ascending till it dies away, as if at an immense distance, and all the while diffusing itself through the circumambient air; if a good voice sings, or a musical instrument is well played upon, the effect is inexpressibly agreeable." In this chapel is the monument of Marjory Bruce, daughter of Robert I. king of Scotland, and mother of Robert II. Here were likewise interred Elizabeth Muir, and Euphemia Ross, both consorts to the monarch last mentioned. The former died previous to his accession to the Scottish throne.

Of the Roman camp mentioned by Camden, as situated close to Paisley, very few vestiges remain; the walls are nearly levelled, and the ditches filled up. Of the outworks no distinct marks are now visible, excepting of one which was constructed at a spot still bearing the name of Castle Head. A military road led to this entrenchment, which is supposed to have been the Vanduara of Ptolemy.

Elderslie, in the vicinity of this town, is noted, in the annals of Scotland, as the birth place of the illustrious sir William Wallace. (See WALLACE.) Pennant's *Tour in Scotland*. Beauties of Scotland, vo. iii.

PAIT, a provincial term applied to a badger.

PAITA, GIOVANNI, of Genoa, in *Biography*, flourished early in the last century, and was called by all the great masters,

masters, king of *tenors*; they speak still in Italy of the merit of this admirable singer, who was likewise an excellent actor, and a fine performer on the harpsichord.

PAITA, in *Geography*. See PAYTA.

PAITAN, a town on the N. coast of the island of Borneo. N. lat. 6° 32'. E. long. 117° 28'.

PAITLEY, or PATELEY-BRIDGE, a small market town in the parish and liberty of Rippon, lower division of the wapentake of Claro, and west riding of Yorkshire, England, is situated on the river Nidd, at the distance of twelve miles W.S.W. from Rippon. The market is held on Saturday, and here are four fairs annually. Neither the town nor its vicinity present any thing remarkable. It is somewhat singular that it should not be mentioned in the late population reports, though several townships in the same parish are there noticed. Beauties of England and Wales, vol. xvi. by J. Bigland.

PAITSEPOO, a town of Little Bucharia; 50 miles E.N.E. of Cashgar.

PAKA, a town of Bohemia, in the circle of Konigin-gratz; 18 miles N.W. of Konigingratz. N. lat. 50° 25'. E. long. 15° 22'.

PAKANG-YAY, a town of the Birman empire, situated on the Irawaddy, containing several neat temples, and surrounded by lofty palmyra, tamarind, and banyan trees; 25 miles S. of Pagahm.

PAKASHASANA, a name of the Hindoo deity Indra, regent of the visible heavens.

PAKIR, or PACHIR, in *Geography*, a sea-port town of Arabia, in the province of Oman, the inhabitants of which carry on a considerable trade to India. Its environs abound in cattle, grain, dates, raisins, and other fruits; 25 miles E. of Döfar.

PAKOLTSZ, a town of the duchy of Warsaw; 34 miles N. of Gnesna.

PAKRATZ, a town of Sclavonia; 20 miles N.W. of Potzega.

PAKUPZKI, a town of Croatia, on the Kulpa; 20 miles E. of Carlstadt.

PALA, in *Botany*, a name by which some authors have called the nutmeg-tree.

PALA, in *Geography*, a town on the W. coast of the island of Celebes. S. lat. 2° 32'. E. long. 119° 9'.

PALA, in *Ichthyology*, a name used by some authors for a fish of the truttaceous kind, more usually known by the name of *ferra*. See GUINIAD.

PALACE, PALATIUM, a name generally given to the dwelling houses of kings and princes.

Procopius derives the word from a Grecian called Pallas, who gave his own name to a magnificent house he had built; adding that Augustus, after him, gave the name *palatium* to the house of the Roman emperors on the hill which for that reason was called the *Palatine* mount. Others take it the contrary way; and say that Romulus's house, in which Augustus lived, was properly called *palatium*, because situate on the *Palatine* mount. Be this as it will, it is certain, *palatium*, from a proper name, in time became common to all houses of kings.

And as the kings usually heard and determined causes in their houses, in what part of the realm soever they were situate; hence also *palatium* became a name for a court of justice, which usage is still retained, especially in France.

In course of time the name *palace* has also been applied to the houses of other persons: taking different epithets, according to the quality of the inhabitants; as imperial palace, royal palace, pontifical, cardinal, episcopal, ducal palace, &c.

PALACIOS, I.os, in *Geography*, a town of Spain, in the province of Seville; 10 miles S.E. of Seville.

PALACIOS, a town of Spain, in the province of Leon; eight miles S. of Astorga.

PALADA, a town of Hindoostan, in the circle of Aurungabad; 48 miles S.E. of Aurungabad.

PALÆMON, QUINTUS REMMIUS, in *Biography*, a celebrated Roman grammarian in the reigns of Tiberius and Claudius, was a native of Vicenza, and domestic slave to a woman of that place, but by attending her son to the academy he acquired so much knowledge, that she gave him his freedom, and he opened a grammar school at Rome. He gained great reputation as a rhetorician and poet, but his morals were so loose, as to be considered a very improper preceptor for young people. His income, however, as teacher was very considerable, but quite inadequate to his luxurious mode of living. The remains of this writer, who was so arrogant as to say that letters were born, and would die with him, are "Ars grammatica," printed among the "Grammatici Antiqui," of which the best edition is that of 1605; and a treatise "De Ponderibus et Mensuris," printed at Leyden in 1587, which has been ascribed to another writer of the same name.

PALÆPHATUS, a Greek philosopher of whom a treatise *περι των Απισθων* remains; its subject is the explication of ancient fables. It has been several times reprinted in the Greek and Latin; the best edition is that of Fischer, Lips. 1761. It must be observed that there are several ancient writers of this name; one an Athenian, placed by the poets before the time of Homer; one a native of Paros, who lived under Artaxerxes Mnemon; and one, a grammarian and philosopher, born at Athens or in Egypt, posterior to Aristotle. Which of these is author of the work already noticed, is not at all certain.

PALÆSTE, the name of a Greek measure of length, being the same with the *dochme* and *doron*, and containing four finger-breadths, or digits.

PALÆSTRA, *παλαιστρα*, among the ancient Greeks, a public building, where the youth exercised themselves in wrestling, running, playing at quoits, &c.

Some say, the *palæstra* consisted both of a college, and an academy; the one for exercises of the mind, the other for those of the body. But most authors rather take *palæstra* to be a *gymnasium*, or mere academy for bodily exercises, according to the etymology of the word, which comes from *παλν*, *wrestling*, one of the chief exercises among the ancients. See PALE'.

The length of the *palæstra* was marked out by *stadia*, each equal to one hundred and twenty-five geometrical paces; and hence the name *stadium* was given to the arena whereon they ran.

PALÆSTROPHYLAX, formed from *παλαιστρον*, and *φυλαξ*, *guardian*, or *keeper*, among the *Ancients*, was the director of a *palæstra*; and of the exercises performed therein.

This officer was also called *gymnarcha* and *gymnastarcha*.

PALAFIX Y MENDOZA, D. JUAN DE, in *Biography*, a Spanish prelate, was born of a noble family at Arragon, in the year 1600. He studied at Salamanca, after which he was appointed a member of the council of war, and next of that of the Indies; but he renounced civil distinctions for the ecclesiastical state, and was made a bishop in Spanish America, with the title of judge of the administration of the three viceroys of the Indies. Zeal for the interests of the church involved him in some difficulties, and he was compelled to secrete himself to save his life. His conduct was, however, in every respect approved by the king, and he was appointed to the bishopric of Osma in 1653, in which he

continued

continued till his death, in 1659. He was a voluminous writer, but the works by which he is chiefly known, are the "History of the Siege of Fontarabia," and "The History of the Conquest of China by the Tartars."

PALAFUGELL, in *Geography*, a town of Spain, in Catalonia; 20 miles S.E. of Gerona.

PALAIS, LE, a sea-port town of France, and capital of the island of Belle Isle, situated on the E. coast, and defended by a citadel, with good anchorage in the road; containing two churches, and about 500 houses; 2½ miles S.E. of L'Orient. N. lat. 47° 21'. W. long. 3° 4'.

PALAIS, St., a town of France, in the department of the Lower Pyrenées, and chief place of a canton, in the district of Mauléon, seated on the Bidouze; 21 miles S.E. of Bayonne. The town contains 1000, and the canton 14,673 inhabitants, on a territory of 330 kilometres, in 42 communes. N. lat. 43° 19'. W. long. 0° 50'.

PALAIZEAU, a town of France, in the department of the Seine and Oise, and chief place of a canton, in the district of Versailles; seven miles S.E. of Versailles. The place contains 1750, and the canton 9560 inhabitants, on a territory of 130 kilometres, in 17 communes.

PALAKA, a town of Turkish Armenia, in the government of Kars; 60 miles N.N.E. of Kars.

PALALACA, in *Natural History*, the name given by the people of the Philippine islands to a bird common among them, and somewhat resembling the *upupa*, or hoopoe. From the description which father Camelli gives of this bird, it seems very plainly to be a species of woodpecker, of a very large and beautiful kind. See *Picus Bengalensis*.

PALAMADA, in *Geography*, a town of Bengal; 28 miles S.E. of Doefa.

PALAMBANG, or **PALEMBANG**, a river of Sumatra, which takes its rise in the country of Moofee, near the W. coast, and within a day or two's journey from that of Bencoolen, and is the most advantageous for navigation of any in the island. High up, on its banks, the pepper is cultivated, and purchased of the natives at a very cheap rate — Also, a town and kingdom of Sumatra. The town is situated on the above mentioned river, and is the capital of the kingdom, which is very extensive, and comprehends the island of Banca. Palambang is peopled mostly by Javans, in consequence of that part of the island being formerly under the jurisdiction of the Bantam empire, whence its sovereigns derived their appointment. It has been since under the immediate protection of the Dutch government at Batavia, who have had a chief and factory there, and procure from it pepper and tin. It has likewise been an useful mart to them, for vending opium and other commodities from the west of India. The inhabitants of Passumah are mostly supplied with opium, salt, and piece goods from Palambang. The king's agent comes up the river in large boats, which are towed against the stream. Thus the goods are conveyed to a place called "Mooarro Moolang," from whence they are transported on men's backs to that country. The voyage by the river is said to take up 14 days; but the journey from Mooarro Moolang, where they disembark, to Passumah, is performed in one. Their returns are mostly in a species of twine called poolay, silk in its roughest state, and elephants' teeth. The tin, though exported from Palambang, is dug up in the island of Banca, which covers the mouth of the river, and constitutes a trade of considerable importance. The king of Palambang, whose dominions are very extensive, reaching as far as the hills of Lampoon to the southward, and comprehending the island of Banca, accumulates immense riches. It is said that the quantity of pepper brought annually from Palambang is about 2,000,000 lbs.

which is purchased at the rate of two stivers *per lb.* The Dutch company likewise take about 1000 carats of rough diamonds, and a considerable quantity of canes and rattans. For these commodities a large sum in specie is yearly required to balance with the king. In 1771 the Dutch company rebuilt there an old ruined fort in a pentagonal form, at the charge of about 7322½ sterling. S. lat. 2° 50'. E. long. 104° 59'. Marsden's Sumatra. Stavonius's Voyage, vol. 1.

PALAMBUAN. See **BALAMBUAN**.

PALAMCOTTA. See **TINEVELLY**.

PALAMEDEA, the Screamer, in *Ornithology*, a genus of birds of the order Grallæ, of which the generic character is; bill conic, the upper mandible hooked; nostrils oval; feet four-toed, cleft, a very small membrane connecting the toes at the root. There are only two species of this genus.

Species.

CORNUTA; Horned Screamer. Wings with two spines at the bend; the front is horned; hence its specific name. The birds of this species are about as large as a turkey; they have on the crown of their head a slight horn rising perpendicularly, about three inches in length. They feed on herbs and seeds, and perhaps on reptiles. They are found in Guiana and other neighbouring territories of South America, chiefly in the low and marshy grounds. These birds are never observed but in pairs, and so faithful, tender, and constant is their attachment, that the death of one is generally attended with a degree of distress and grief which destroys the other. While young they are eaten, but their flesh is of very dark colour, though not ill tasted. The legs are black, and so is the bill; the irides golden; body above blackish, beneath white; wings reddish beneath; spines strong, sharp, horny, triangular, yellow; horn on the front recurved, round, whitish, three inches long; the hind-toe is straight. They lay two eggs, which are about the size of those of a goose.

CRISTATA; Crested Screamer. Wings unarmed; front crested. It inhabits Brasil, and is about the size of a heron. The bill and legs are yellowish; the irides golden; crest black varied with cinereous, erect; the body is mixed with rufous and brown; the hind toe is placed so high as not to touch the ground in walking. The birds of both species, on hearing the least noise, or seeing any person, though at a distance, rise from the ground, and make a loud screaming noise.

PALAMEDES, in *Biography*, a distinguished Greek, was the son of Nauplius, king of the isle of Eubœa. At the time of the Grecian confederation for the expedition against Troy, Palamedes is said by a stratagem to have detected the counterfeited insanity of Ulysses, who had acted the madman, in order that he might be excused from accompanying the other princes. In resentment for this exposure, Ulysses contrived to bury a sum of money in the tent of Palamedes, and then to charge him with having received a bribe from Priam. The discovery of the treasure was deemed evidence of the fact, and Palamedes was stoned to death for the crime of treason. To him are attributed the invention of weights and measures; the art of drawing up a battalion; the regulation of the year by the course of the sun, and of the month by that of the moon; likewise the games of dice and even chess are ascribed to him. Pliny affirms that during the siege of Troy he invented the four letters in the Greek alphabet θ , ξ , ϕ , χ ; but Philostratus ascribes to him only the ν , ζ , and χ . He has been mentioned as a poet, and Suidas says his poems were suppressed by Agamemnon, or by Homer.

PALAMOS, in *Geography*, a sea-port town of Spain, in

in Catalonia, on the coast of the Medierranean, fortified and defended with a castle; 22 miles S.E. of Gerona. N. lat. $41^{\circ} 50'$. E. long. $2^{\circ} 58'$.

PALAMOW, a town of Bengal, and capital of a circar to which it gives name. The circar is bounded on the N. by Bahar, on the E. by Koondah, Torea, and Nagpour, on the S.E. by Burwah, on the S.W. by Sirgooja, and on the W. by Bittounja, about 80 miles long and 40 in its greatest breadth. The capital is 120 miles S.S.W. of Patna. N. lat. $23^{\circ} 48'$. E. long. $84^{\circ} 20'$.

PALAMPONG, a town on the W. coast of the island of Leyta. N. lat. $10^{\circ} 58'$. E. long. $124^{\circ} 14'$.

PALANA, a town of Peru, in the audience of Quito; 50 miles S. of Loxa.—Also, a town on the W. coast of the island of Luçon, at the entrance of Caigaran bay. N. lat. $16^{\circ} 45'$. E. long. $122^{\circ} 14'$.

PALANDO, a town of South America, in the province of Quito; 45 miles S. of Loxa.

PALANE, a river of Africa, which runs into the Indian sea, near Mozambique.

PALANKA, a town of European Turkey, in Bulgaria; 40 miles S. of Sophia.—Also, a town of European Turkey, in Bessarabia, on the Dniester; 32 miles N.W. of Akerman.

PALANQUIN, or PALANKEEN, a kind of chaise, chair, or litter, borne by men on their shoulders; much used by the people of China, and the East, as a vehicle for their easy conveyance from place to place.

PALANTONE, in *Geography*, a town of Italy, in the department of the Lower Po; 12 miles N.W. of Ferrara.

PALANY, a town of Hindoostan, in Bahar; 7 miles S.E. of Bahar.

PALANZA, a town of Italy, on the W. side of lake Maggiore; 15 miles S.E. of domo d'Oscello.

PALAO. See *New PHILIPPINES*.

PALAPARIJA, in *Zoology*, the name of a species of East India serpent, found in the island of Ceylon. It is a large kind, and beautifully variegated in colour, with a great deal of red about it. It is one of those species which naturally live underground.

PALAPETTY, in *Geography*, a town of Hindoostan, in the province of Dindigul; 18 miles N. of Dindigul.

PALAPOUR, a town of Bengal; 22 miles E. of Boglipour.

PALAPRAT, JOHN, in *Biography*, a poet and dramatic writer, was born at Toulouse in the year 1650. He distinguished himself from his youth by a talent for poetry, and obtained several prizes at the Floral games of that city. He was brought up to the legal profession, and obtained some offices of consideration, in which he conducted himself with great credit. At length an attachment to literature, and a natural simplicity of character, gave him a distaste for business; and after a visit to the wits of Paris, he went to Rome in 1686 for the purpose of being introduced to the celebrated queen Christina, then resident in that metropolis. Thence he returned to Paris, which afterwards became his principal abode. In 1691 the duke of Vendome attached him to his person in quality of secretary. He employed himself, at Paris, chiefly in theatrical compositions, and he contracted an intimacy with the abbé Brueys, in concert with whom he wrote several pieces for the stage. Of their conjunct performances, three have kept their place on the stage, with one of his sole composition. He also wrote eight discourses on different subjects, and published a volume of poems. He died at Paris in 1721, in the seventy-second year of his age. The character of his works is gaiety and vivacity, with an air of simplicity, but with little regard to

correctness. His dramatic pieces are contained in the collection of those of Brueys.

PALARIA, among the Romans, a kind of exercise performed at a stake by the soldiers.

The stake being fixed immovable in the ground, and six feet high above it, the young undisciplined soldiers advanced against it armed with a burdie and cudgel, instead of a shield and sword, and went through all the rules of attack and defence, as if actually engaged with an adversary. Sometimes they stood at a distance, and attacked it with missile weapons, at the same time using all the requisite motions for defending themselves, and warding off what might be thrown against them.

PALASBARY, in *Geography*, a town of Bengal; 6 miles N.N.E. of Goragot.

PALASBONA, a town of Bengal; 16 miles S. of Rajemul.

PALASCO, a town of Corsica; 14 miles N. of Corte.

PALASZ, a town of European Turkey, in Servia; 15 miles S.W. of Belgrade.

PALATCHA, or PALATSA, a town of Asiatic Turkey, in Natolia, near the coast of the Archipelago; 8 miles N. of Milets. N. lat. $37^{\circ} 31'$. E. long. $27^{\circ} 12'$.

PALATCHY, a town of Hindoostan; 15 miles S. of Coimbatore.

PALATE, the upper part or roof of the mouth in animals of different kinds.

In a horse it should be lean, for if it be full and high, so as to be nearly level with the extremities of the upper teeth, the least height in the liberty of the bit will be troublesome, and make him either check in the bridle, and be always throwing up his head, or otherwise carry it too low, which, besides the unfitness, much annoys the rider's hand.

PALATE, in *Anatomy*, the roof of the mouth. It is the arched superior boundary of that cavity, and, at the same time, the inferior surface or floor of the nose. The anterior two-thirds of it are made up of the palatine plates of the superior maxillary and palatine bones, surrounded by the teeth and covered by a firm membrane: the posterior third is a moveable membranous and muscular organ, called the soft palate, velum palati or palatum molle. These parts are more minutely described in the article *DEGLUTITION*.

PALATE, *Diseases of*. See *TONSILS* and *UVULA*. A description of the defective state of the palate, frequently accompanying the hare-lip, is noticed in the article *HARE-LIP*.

PALATI OSSA, in *Anatomy*, two small bones of the upper jaw. See *CRANIUM*.

PALATINATE, PALATINATUS, a province or fignory, possessed by a palatine, and from which he takes his title and dignity.

The palatinates now subsisting, are either those of Germany or Poland. Those of Germany are the principalities of the Upper and Lower Rhine, *i. e.* of Bavaria, and the Rhine.

The palatinates in Poland are the provinces and districts of the Polish grandees or senators, who are the governors thereof.

PALATINATE of the Rhine, or Lower Palatinate, in *Geography*, a country of Germany, in the circle of the Lower Rhine; bounded on the N. by the electorate of Mentz and Catzenelnbogen, on the E. by Catzenelnbogen, the electorate of Mentz, the bishopric of Worms, and a part of Franconia, on the S. by Wurtemberg and the bishopric of Spire, and on the W. by France, the duchies of Deux Ponts and Simmern, and the county of Sponheim. Its greatest extent is about 80 miles. Although the country

is mountainous, it is uncommonly fertile, and produces plenty of corn, pulse, fruit, chestnuts and walnuts, and its pasturage seems to yield a good breed of cattle. It has plantations of tobacco, particularly between Heidelberg and Mannheim, and also good Nectar and Rhenish wines (See BERGSTRASS.) The Rhine traverses this electorate palatine; and out of the lands near Germerheim and Veltz is washed the best Rhenish gold, to which the Rhenish gold florins owe their origin. The electorate palatine contains 41 towns and several boroughs. The ecclesiastical state has undergone many changes, as the doctrines of Calvin and Luther have alternately prevailed ever since the reformation was first introduced in the year 1518. The name and origin of the "Palatines" are deduced from the palatia, or palaces, which the old Frankish and German kings and emperors possessed in various places, and over which they appointed stewards and judges, who were styled "Pfallenzgraves" or "Pfalzgraves." The addition of *by* or *on the Rhine* first occurs in the year 1093. The electoral palatinate, ever since the resignation of the Upper Palatinate to the elector of Bavaria, paid only one-half of the electoral evaluation. All that part of the palatinate which lay on the left side of the Rhine was by the peace of Lunéville ceded to France, and forms the department of Mont Tonnerre.

PALATINATE, *Upper*, a part of Bavaria, bounded on the W. and N.W. by Franconia, on the E. and N.E. by Bohemia, and on the S. by the duchy of Neuburg and Lower Bavaria. In the 12th century this country belonged to the dukes of Swabia: it was afterwards annexed to the palatinate of the Rhine. By the peace of Baden, in 1714, it was ceded, after some previous changes of masters, to the elector of Bavaria. The capital is Amberg.

PALATINE, PALATINUS, in *Anatomy*, an epithet applied to many parts about the roof of the mouth: as the palatine artery, a branch of the internal maxillary, see ARTERY; the palatine glands, see DEGLUTITION; the palatine ducts, which were supposed communications between the nose and mouth through the anterior palatine holes or foramina incisiva; the palatine nerves, branches of the superior maxillary, see NERVE; the palatine processes, of the superior maxillary and palate bones. See CRANIUM.

PALATINE, *Count Palatine, Comes Palatinus*, in *Ancient Customs*, was a title given to all persons who had any office or employment in the prince's palace.

The appellation is derived hence, that anciently the emperors sent the judges of their palace, whom they called *comites palatini*, or *pals-graves*, to correct the abuses of the other judges in the provinces of Saxony, Bavaria, Franconia, and the Rhine.

Matthæus says, that the palatines were originally those who had the superintendance of the palace, the same with what the Greeks called *europalate*, and the French *maîtres du palais*: though in time the name became more general.

The title of count palatine is now appropriated to the princes of Sultzbach, Deuxponts, and Berkenfeld, who are three branches of the same family. The elector palatine is a prince of the first of these branches, *i. e.* the prince palatine of the Rhine.

PALATINE was afterwards a title conferred on those delegated by princes to hold courts of justice in the provinces; and on such among the lords as had a palace, *i. e.* a court of justice in their own houses.

The French writers make the palatines of Champagne to be the first who bore that title; which, they will have it, the Germans and other people borrowed from them, not they from the Germans.

At present the word palatine is restrained to a prince of

Germany, or a lord of Poland, possessed of a palatinate. In the code we find a title "De palatinis sacrarum largitionum." These were a kind of treasurers of the empire.

PALATINE, in *Geography*, a post-town of America, in Montgomery county, New York, on the N. side of Mohawk river and W. of Caghawaga; containing 3517 inhabitants. The compact part contains a reformed Dutch church, and 20 or 30 houses; 36 miles above Schenectady.

PALATINE *Bridge*, a bridge of ancient Rome, now called *St. Mary's* bridge, which crosses over from the present church of St. Mary the Egyptian, at the lower end of the forum boarium to the via Trans-tiberina. This bridge is supposed to be that which Livy speaks of (Decad. 4. l. 10.), built by M. Fulvius, washed down by the Tiber, and afterwards rebuilt by the censors Scipio Africanus and L. Mummius. Another inundation having damaged it, pope Gregory XIII. repaired it, partly upon the old piles, in the year 1575. But another inundation sweeping away some of it in 1598, it has never since been repaired, so as to be serviceable.

PALATINE, *County*. See COUNTY.

PALATINE *Mount*, one of the seven principal hills inclosed within the walls of ancient Rome. Whether the Palatine hill received its name, from a people called Palantes or Palatini, or from the bleating or strolling of cattle, in Latin balare and palare; or from Pales, the pastoral goddess; or from the burying place of Pallas, is disputed among the learned, and undetermined. Here, however, Romulus laid the foundation of his city, in a quadrangular form; and here the same king and Tullus Hostilius kept their courts; as did afterwards Augustus and all the succeeding emperors; on which account the word "palatium" came to signify a royal seat. To the E. of this hill is Mons Cælius, to the S. Mons Aventinus, to the W. Mons Capitolinus, and to the N. the forum. Its compass is 1200 paces. Romulus's house, preserved for several ages by the care of the senate, was on this hill, near the spot where the church of St. Anastasia now stands; as was also that of his foster-father Faullulus, near the place now occupied by the church of Sancta Maria Liberatrice.

PALATINE *Games, ludi Palatini*, among the Romans, were games instituted in honour of Julius Cæsar, as some will have it, or, as others say, of Augustus, and celebrated in his palace during eight days, from the sixth calends of January. Suetonius informs us, that Caligula attended these games when he was assassinated. "Cum placuisset palatinis ludis spectaculo egressum meridie aggredi."

It is pretended, that Dion calls them *Augustalia*; which should seem to confirm the second opinion. Indeed, it is certain, that he says Livia instituted particular games in the Palatine Mount, in honour of that prince, but he apparently distinguishes them from those called Augustalia. The Romans had also their Apollo Palatinus, a surname of that deity, given him in respect to the temple erected to him by Augustus on the Palatine Mount, in consequence of a report of the aruspices, which required it to be done: Augustus enriched it also with a noble library; as is intimated by Horace, lib. i. epist. iii. ver. 17.

PALATINE *Tribe*, was one of the four tribes into which Rome was anciently divided by Servius Tullus.

Servius Tullus added a fourth tribe to the three tribes into which Rome was divided by Romulus; and having inclosed the seven hills within the city, and divided it into four quarters, which he named from the principal hills they contained, he assigned to each tribe its appropriate district. Thus, the inhabitants of the Capitoline mount, the Palatine mount, and the space between these two hills, composed the

the first tribe, called "Tribus Palatina." They who dwell in the quarter called Suburra, containing mount Cælius, formed the second tribe, which retained the name of "Tribus Suburrana." The inhabitants of the Esquiline mount were called "Tribus Esquilina." And they who lived on the mounts Viminalis and Quirinalis, bore the name of the hills on which they were placed, and were called "Tribus Collina" or "Collatina."

PALATINI. See ACOLYTHI.

PALATO-PHARYNGEUS, in *Anatomy*, a muscle of the palate. See DEGLUTITION.

PALATO-STAPHYLINUS, a synonym of the *azygus uvulæ*.

PALATULUNGA, in *Geography*, a town of Hindoostan, in Coimbatore; 15 miles S.W. of Erroad.

PALATUM MOLLE, in *Anatomy*. See PALATE.

PALAVAI, in *Geography*, a town of the island of Ceylon; 48 miles W.N.W. of Candy.

PALAVASOURY, a town of Hindoostan, in the circar of Joodpour; 15 miles E. of Joodpour.

PALAVIA, in *Botany*, so named in honour of Don Antonio Palau y Verdera, professor of Botany in the royal garden at Madrid, who translated the *Philosophia Botanica* of Linnæus into Spanish, and who, according to Cavanilles (see his *Diff. fasc. 1. 5.*), has given much attention to the genera and species of plants. This gentleman is the author of several botanical or economical treatises in his native tongue. His name appears, with that of *Ortega*, (see ORTEGIA,) in the title-page of a *Curso elemental de botanica*, published at Madrid, in Svo. anno 1785, which perhaps is the translation of Linnæus above-mentioned; but it contains, moreover, a Spanish version of the essential generic characters of that author. Cavanilles wrote the name of this genus *Palava*, which Schreber has properly corrected. Schreb. 464. Willd. Sp. Pl. v. 3. 767. Mart. Mill. Dict. v. 3. (Palava; Cavan. *Diff. 1. 40. Juss. 271. Lamarck Illustr. t. 577.*)—Class and order, *Monadelphia Polyandria*. Nat. Ord. *Columniferæ*, Linn. *Malvaceæ*, Juss.

Gen. Ch. Cal. Perianth simple, inferior, of one leaf, cloven half way down into five segments, permanent. Cor. Petals five, roundish, inserted into the base of the tube of the stamens. Stam. Filaments numerous, united below into a tube, separate above; anthers roundish. Pist. Germen superior, globose; style short, divided in the upper part into many segments; stigmas capitate. Peric. Capsule roundish, of many cells, which do not burst, and are clustered about an elevated central receptacle. Seeds solitary, roundish, angular.

Eff. Ch. Calyx simple, five-cleft. Capsule of numerous single-seeded cells, clustered irregularly together.

Obs. This genus differs from *Malope*, merely in having a simple calyx. We have already (see MALOPE) mentioned professor Martyn's remark concerning it, and we now adopt it on the authority of the above authors.

1. *P. malvifolia*. Willd. n. 1. Cavan. *Diff. 1. 40. t. 11. f. 4.* (*Malope parviflora*; L'Herit. *Stirp. Nov. fasc. 5. 105. t. 50.*)—Leaves smooth. Flower-stalks the length of the footstalks. Stem prostrate.—Native of Peru and Lima, in sandy ground. See MALOPE, sp. 2.

2. *P. moschata*. Willd. n. 2. Cavan. *Diff. 1. 41. t. 11. f. 5.*—Leaves downy. Flower-stalks longer than the footstalks. Stem erect.—Native of sandy ground about the town of Lima, where it was gathered by the celebrated and unfortunate Dombey, flowering in September. The root is annual, long and fibrous. Whole plant clothed with soft short down, and smelling of musk. Stem erect, branched,

leafy, two feet high. Leaves on shortish stalks, alternate roundish-heart-shaped, obtuse, waved and crenate, about two inches long. Stipulas small, lanceolate, dark-coloured, Flowers solitary, on simple axillary stalks, longer than the leaves. Calyx bell-shaped. Petals yellowish-purple, about an inch long.

PALAWAN, in *Geography*. See PARAGUAY.

PALAZOL, a small island in the Adriatic. N. lat. 44° 46'. E. long. 14° 47'.

PALAZZUOLO, a town of Italy, in Friuli; 14 miles S.W. of Palma la Nuova.—Alfo, a town of Italy, in the department of the Mela; 15 miles W. of Brescia.—Alfo, a town of the island of Sicily, in the valley of Noto; 20 miles W. of Syracuse.

PALCATI NOR, a lake of Tartary, in the country of the Eluthis, called also "Tchoi;" 30 miles W. of Harcas.

PALCIPAS, a town of South America, in the province of Tucuman; 50 miles W.N.W. of St. Fernando.

PALCOOR, a town of Hindoostan; 30 miles S. of Tinevelly.

PALCOTE, a town of Bengal; 16 miles S.S.W. of Doefa. N. lat. 22° 48'. E. long. 84° 53'.

PALDAMO, a town of Sweden, in the province of Cajana; 5 miles N. of Cajanaborg.

PALDIANO, a town of Italy, in the Campagna di Roma; 5 miles E.S.E. of Palestrina.

PALE, PALUS, a little pointed stake, or piece of wood, used in making inclosures, separations, &c.

The pale was an instrument of punishment and execution among the ancient Romans; and still continues so among the Turks. Hence *empalement*; the passing a sharp pale through the fundament up the body.

PALE, in *Heraldry*, is one of the honourable ordinaries of an escutcheon; being the representation of a pale or stake, placed upright; consisting of two perpendicular lines, drawn from the top of the base to the escutcheon, and containing the third middle part of the field.

When there are several, more properly called *pallets*, they are proportioned so as that two take up two-fifths of the field; and three take up three-sevenths: and, in those cases, the number of species are specified, as well as that of those they are charged with, &c.

Pales are borne various ways, as *wavy, crenellé, faillis, indented, ingrailed*, &c. There are also the *cometed*, and *flaming pale*, which are pointed, sometimes waved, &c.

PALE, *Paled*. A coat is said to be *paled*, when it is equally charged with pales of metal, and colour. It is *counter-paled* when it is cut, and the two *demi-pales* of the chief, though of colours the same with those of the point, yet differ in the place where they meet; so that if the first of the chief be metal, that corresponding to it, underneath, is of colour.

The coat is said to be *palisse*, when the pales are pointed like those used in the defence of places.

PALE, *in*, is applied to things borne one above another, in manner of a *pale*.

PALE, *Party per*, is where the shield is divided by a single line through the middle, from top to bottom. See PALY.

PALÉ, *Wrestling*, in *Antiquity*, one of the exercises of the Olympic stadium, first introduced into it in the 18th Olympiad; and Eurybalus, a Spartan, was the first who received the wrestler's crown. Theseus, according to Plutarch, is reported to have been the first who reduced wrestling into a science; and in process of time, though the rules which he laid down are unknown, it was much cultivated by the ancients.

cients. The most remarkable difference between the ancient and modern practice of this art is, that the ancient wrestlers contended naked, and that their bodies were rubbed all over with oil, or with a certain ointment, composed of a due proportion of oil, wax, and dust, mixed up together, which they called "ceroma." These unctions, as some say, were peculiar to the wrestlers, or pancratiasts, whose combats were thus rendered more toilsome and various; while each combatant endeavoured to seize upon the other, whose efforts to escape or break the hold of his antagonist were assisted by the slipperiness, as well as the force and agility of his body. In order, however, to qualify this extreme lubricity of the skin, occasioned by this unction, the athletes were accustomed, before they came to an engagement, either to roll themselves in the mud of the palæstra, (from which some persons derive the words pale and palæstra, πᾶλος signifying mud), or in the sand kept for that purpose, in a place called κομιστήριον, or that with which the place of combat seems to have been covered. It is certain, whatever was the mode of doing it, that the athletes, who were anointed, were always, before they engaged, sprinkled with dust or sand; so that to say an athlete gained a victory, ἀκροῖς, and without being so sprinkled, was the same thing as to say he gained a victory without engaging; which, indeed, sometimes happened, when, either from the great reputation of the champion, or other reasons, none appeared to encounter him. This office of anointing and sprinkling the combatants was sometimes performed by themselves to one another, and sometimes by the officers of the palæstra, called from thence *alipste*, or anointers.

After the wrestlers were thus prepared for the engagement, they were matched by the judges or presidents of the games in the following manner. Into a silver urn, consecrated to Jupiter, and brought forth upon this occasion, were cast so many lots or dice, about the bigness of a bean, as answered to the number of the competitors. These lots were all marked with letters; as for example, upon two of them was written the letter A, B upon two others, and so on in an alphabetical order; if the number of combatants required more, there were always two lots marked with the same letter. This being done, the athletes approached in order, and invoking Jupiter, put their hands into the urn, and drew out each his lot: to prevent all fraud, an officer appointed for that purpose attended upon every one as he came to draw, and held up his hand before him, to hinder his seeing the letters written upon the lot. When every one had drawn, the Alytarches, or one of the presidents of the games, going round to every athlete in order as they stood, inspected the lots. And thus the two, whose lots were both marked with the same letter, as with A or B, were by him matched and appointed to engage with each other. This was the case when the number of the combatants was even, as four, eight, twelve; but when the number was odd, as five, seven, nine, &c. there was put into the urn, together with the duplicate lots, an odd one, marked with a letter to which there was none that corresponded. The athlete who was fortunate enough to obtain this lot, was named *ephedrus*, was to wait till the others had contended, and was then to take up one of the conquerors. This, as Lucian observes, was a very considerable advantage; as the champion, who by virtue of his lot was to wait till the others had contended, and then engage with one of the conquerors, came fresh and vigorous to the encounter, against an adversary, animated indeed and flushed with conquest, but flattered and exhausted in obtaining it.

The wrestlers, being thus matched, proceeded to the combat, in which the victory was adjudged to him who gave his adversary *three falls*; as seems to be evident, from the famous

epigram upon Milo, which will be produced in the sequel of this article.

If one of the combatants in falling drew his antagonist with him, the contest began afresh, or was rather continued upon the ground, until one getting uppermost, constrained his adversary to yield the victory. This combat was called *anacelinopalé*, and seems not so much to be a distinct species from, as a modification of the palé; or an accidental, or perhaps artificial variation of the battle: for he who found himself in danger of being thrown, had sometimes recourse to this stratagem of dragging his adversary with him, and trying upon the ground a combat in which he thought himself better qualified to succeed. However, those authors who have written upon the palé, have made this a distinct exercise; and it is not unlikely but it may have been treated as such in the gymnasia, or schools of exercise; where there were masters whose business it was to give their scholars distinct lessons in every branch of the science they professed to teach: from which custom one may very well account for the many divisions and subdivisions of the palé, and other gymnastic exercises, of which modern writers have made so many distinct species. Of this kind in all likelihood was the *acrocheirismus*; so named, because the combatants, during this part of their engagement, held one another only by the fingers, without seizing on any part of the body. This has been reckoned a distinct exercise, and another division of the palé; though, as Mons. Burette very well observes, it seems rather to have been the prelude of the combat, in which the antagonists made trial of each other's strength, or endeavoured, perhaps, by seizing each other's hands, mutually to prevent one another from taking a firmer and more advantageous hold.

The champion who distinguished himself the most in this exercise, was Milo of Crotona, who gained no less than six Olympic, and as many Pythian crowns. There are so many instances of the prodigious strength of this famous wrestler, and most of them so well known, that it would be endless and impertinent to cite them all: but we cannot forbear producing one, as remarkable for the singularity, as the issue of the experiment.

This Milo, to give a proof of his astonishing force, was wont to take a pomegranate, which, without squeezing or breaking it, he held so fast by the mere strength of his fingers, that nobody was able to take it from him; nobody but his mistress, says Ælian. But however weak he may have been with regard to the fair sex, his superior force was universally acknowledged by the men, as will appear by the following epigram:

When none adventur'd, in th' Olympic sand
The might of boist'rous Milo to withstand;
Th' unrivall'd chief advanc'd to seize the crown,
But 'mid his triumph slip'd unwary down.
The people shouted, and forbade bestow
The wreath on him, who fell without a foe.
But rising, in the midst he stood, and cry'd,
Do not *three falls* the victory decide?
Fortune indeed hath giv'n me one, but who
Will undertake to throw me th' *other two*?

West's Pindar.

PALEARIUS, AONIUS, in *Biography*, an elegant and liberal scholar, and martyr to the cause of the reformation, was born about the beginning of the sixteenth century, at Veruli, in the Campagna of Rome. The name of his family was Della Paglia, and his baptismal name was Antonio, both which he changed to the classical form under which he

is known. Having studied six years at Rome, he quitted it on the approach of the imperial army in 1527, and took up his abode at Perugia, Sienna, Padua, and other places, improving himself by attendance on the most celebrated professors. He fixed at length at Sienna, where he married in 1536, and opened a private school for some young men of rank. Here he passed some years tranquilly in the bosom of his family, till the freedom of his opinions began to excite against him many enemies. The suspicion into which he fell, as being a favourer of the new opinions, gave the monks a handle, and they publicly accused him of heresy. He was brought before the archbishop and governor. On this occasion he wrote an oration, in which, though he did not avow the opinions imputed to him, he spoke of them in a way that shewed what he thought upon those points. He was acquitted, but was successfully opposed in his attempts to obtain a professorship in the university. In 1544 he published a work "On the Merits of Christ," which was written on the principles of the reformers. He received an invitation, in 1546, to take the professorship of eloquence at Lucca, with which he complied, and exercised that office for several years. In 1555 he was invited to Milan, to succeed Majoragio in the chair of eloquence. He resided quietly in that city till the accession of pope Pius V., who having been a Dominican and Inquisitor, began his reign with the severe persecution of heresy. Palearius was one of the first victims to his cruelty; the charges exhibited against him were very serious, and of these he was found guilty, and condemned to the flames. The sentence was executed in July 1570. Such was the lamentable fate of one who was universally admitted to be moral, pious, and learned. Of the writings of Palearius, the best known is his poem "De Immortalitate Animorum," in three books, first printed at Lyons in 1536. Its versification is formed upon that of Lucretius, rather than that of Virgil. It has been reprinted in several collections of select Latin poetry by Italians. His other works are fourteen orations on different subjects, letters, and poems, all written in a pure Latin style. After his death was printed a work entitled "Actio in Pontifices Romanos et eorum Affectus," which he had composed a short time before the meeting of the council of Trent, with an intention of getting it presented by the ambassadors of the emperor. It is said to be an eloquent plea in favour of the reformed religion.

PALECKE, in *Geography*, a town of Prussia, in the province of Oberland; 14 miles S.E. of Mohrungen.

PALED FLOWERS, in *Botany*, are those which have thin leaves set about, or surrounding a head, or thrum; as in marigolds, &c.

PALEE, in *Geography*, a town of Hindoostan, in Oude; 45 miles W. of Kairabad.

PALEMON, in *Mythology*, a deity so called by the Greeks, the same with the Melicartus of the Phœnicians, and Portumnus among the Romans. See PORTUMNUS.

PALENCIA, in *Geography*, a city of Spain, in the province of Leon, which has a very ancient bishopric, suffragan to Burgos: the bishop enjoys a revenue of 2500*l.* to 2900*l.* and bears the title of count. This town is situated in a fertile territory, watered by the little river Carrion, on the banks of which it stands. Most of the edifices of this town are in the Gothic style; and the most remarkable is San-Antolin, a church built and dedicated to that saint by king Sancho, after having escaped great danger in hunting wild boars. At the beginning of the 13th century, this town had an university, established by Rodrigo the bishop, and the first founded in Spain after the invasion of the Moors. In 1239, this university was removed to Salamanca. Its district, called the Tierra de Campos, is remarkable for its

fertility. It contains 5 churches, 11 convents, and 2 hospitals; 57 miles S.E. of Leon. N. lat. 41° 59'. E. long. 4° 34'.

PALENO, a town of Naples, in Abruzzo Citra; 9 miles E. of Sulmona. N. lat. 43° 3'. E. long. 14° 2'.

PALENQUE, a town of Mexico, in the province of Chiapa; 60 miles S.E. of Chiapa dos Espagnoles.—Also, a small island in the Spanish main. N. lat. 9° 30'. W. long. 79° 5'.

PALENSSEN, a town of Westphalia, in the principality of Calenberg; 6 miles S. of Hanover.

PALENZUELA, a town of Spain, in Old Castile; 25 miles S.W. of Burgos.

PALEO-CASTRO. See POLICASTRO.

PALEOCASTRO, a town on the N. coast of the island of Lemno. N. lat. 40°. E. long. 42° 55'.

PALEOTTI, GABRIEL, in *Biography*, a learned Italian cardinal, descended from an illustrious family, was born at Bologna in the year 1524. He was intended for the profession of the civil and canon law, and made a rapid and very successful proficiency in the study of literature and jurisprudence, at the university in his native city. He was in early life appointed to the canonry of Bologna; after which he was appointed professor at the university. Here he acquired high fame by his lectures and publications, and was distinguished by the accuracy of his judgment and the goodness of his taste. Being led to visit Rome, he was appointed by cardinal Alexander Farnese, who had been his fellow-student at Bologna, and who was just appointed perpetual legate of Avignon, governor of Vaïsson, in the county of Venaisin, which he was led to decline, on account of some family concerns which he was obliged to attend to at Bologna, where he resumed the professor's chair. The Farnese family were, however, resolved to make his fortune, and obtained for him the post of auditor of the rota, when he was only thirty-three years of age. When pope Pius IV. opened the council of Trent, he sent Paleotti thither in the capacity of proctor and counsellor to his legates, who took no step of importance without his advice. Of this council Paleotti wrote a history, which still remains in MS. In 1565 he was raised to the dignity of the purple by Pius IV. and by Pius V. he was created bishop of Bologna, and that see was erected into an archbishopric by the same pope, to do honour both to Paleotti and his native country. So exemplary was Paleotti in his diocese, that it was with the greatest reluctance that the popes summoned him to attend the consistories and other business at Rome. He died at Rome in the year 1597, when about the age of seventy-three. He was author of several works of considerable merit, on subjects in antiquities, jurisprudence, and morals. Of these the most considerable are the following, "Archiepiscopale Bonnoniense;" "De imaginibus Sacris, et Profanis;" "De Sacri Consistorii Consultationibus;" "De Nothis, Spuriisque Filiis;" "De Bono Senectutis;" Pastoral Letters, &c. Moreri.

PALEPARTO, in *Geography*, a town of Naples, in Calabria Citra; 10 miles S. of Rosano.

PALEPOLI, a sea-port of Asiatic Turkey, in Carmania, on the S. coast; 220 miles S. of Cogni.

PALERMO, an ancient city of Sicily, in the valley of Mazara, the seat of the viceroy, and the see of an archbishop, was built on the site of the ancient *Panormus*, (which see,) and situated on a bay to which it gives name, on the north coast, well fortified, with a harbour, the entrance of which is defended by two strong citadels. This bay, as well as Palermo, is at the bottom of a great gulf, formed to the eastward by cape Zofarano, and the mountain

of Catalano, and to the westward by mount Pellegrino, the ancient Ereta. Under this hill, which is both high and steep, and the top of which affords a very beautiful and extensive prospect, and commands the most advantageous view of the situation of Palermo, a mote has been formed, where vessels of all sizes obtain a secure shelter. This city, according to Brydone's account, is greatly superior to Naples in beauty and elegance. Although it is not so large, yet the regularity, the uniformity, and the neatness of its streets and buildings render it much more pleasing; it is full of people, who have mostly an air of affluence and gaiety. It stands near the extremity of a kind of natural amphitheatre, formed by very high and rocky mountains; and the country that lies between the city and these mountains is one of the richest and most beautiful spots in the world. The whole appears a magnificent garden, filled with fruit-trees of every species, and watered by clear fountains and rivulets, that form a variety of windings through this delightful plain. From the singularity of this situation, as well as from the richness of the soil, Palermo has had many flattering epithets bestowed upon it, particularly by the poets; who have denominated it "Conca d'Oro," the golden shell, expressing both its situation and richness. It has likewise been styled "Aurea balli," "Hortus Siciliz," &c. and to include all these together, the lasting term of "Felix" has been added to its name, by which it is even distinguished in the maps. Palermo is built upon a very regular plan; its two great streets intersect each other in the centre of the city, where they form a beautiful and regular square called the Ottangolo, adorned with very handsome and uniform buildings. The centre of this square commands the whole of these noble streets and the four great gates of the city which terminate them, and which are at the distance of about half a mile; the diameter of the city being no more than a mile. These are elegant pieces of architecture richly adorned; particularly the Porta Nova and Porta Felice, that terminate the street called the Corso, which runs S.W. and N.E. The lesser streets in general run parallel to these great ones. The Porta Felice (which is by much the handsomest of the gates) opens to the Marino, a delightful and much frequented walk; bounded on one side by the wall of the city, and on the other by the sea, from which there is, in the hottest weather, an agreeable breeze. In the centre of the Marino there is an elegant kind of temple, which serves as an orchestra for music in the summer months. This city contains, besides an university, many churches, abbeys, seminaries, convents, and hospitals. Many of the churches are extremely rich and magnificent. The cathedral (Madre Chiesa) is a very venerable Gothic building, of a large size, supported within by 80 columns of oriental granite, and divided into many chapels, some of which are extremely rich, particularly that of St. Rosalia, the patroness of Palermo, who is held here in greater veneration than even the Virgin Mary herself. Her relics are preserved in a large silver box, curiously wrought and enriched with precious stones. These perform many miracles, and are looked upon as the greatest treasure of the city. The Sacristie too is very rich. The Jesuits church is singularly magnificent; and the Chiesa del Palazzo is entirely covered over with ancient Mosaic. The church of Monreale, about five miles distant from this city, is the next in dignity in the island, after the cathedral of Palermo. About a mile without the city is the famous convent of Capuchins, remarkable for its burial place. This is a vast subterraneous apartment, divided into large commodious galleries, in the walls of which are numerous niches filled with dead bodies, amounting to about 300, standing upright, and dressed in the clothes which they usually wore. The skin and muscles are rendered, by a cer-

tain preparation, as dry and hard as a piece of shell-fish; and although many of them have been here upwards of 250 years, none of them are reduced to skeletons. The bodies of the princes and first nobility are lodged in handsome chests or trunks, the keys of which are kept by the nearest relations of the family. There are two small districts, one to the E. called La Bagaria, and the other to the W. of the city, called Il Colle, where the principal nobility have their country houses. The population of this city is much greater, in proportion to its size, than that of Naples, and the number of carriages is astonishing. One of the grandest exhibitions is that of the feast of St. Rosalia. Palermo had anciently two ports, mentioned by Polybius and Diodorus; which were destroyed by an earthquake in 1327. At present it has two, one for barks, and another for vessels of war, with a light-house at its entrance. This city is commercial, and exports, in favourable years, 40,000 bales of silk. It has some manufactures of stuff and silk. It has occasionally suffered much from earthquakes. Its population is estimated at 130,000 persons. N. lat. 38° 10'. E. long. 13° 25'.

PALERNO, a town of Naples, in Principato Ultra; 12 miles W.N.W. of Conza.—Also, a town of Naples, in Calabria Citra; six miles S.S.W. of Cofenza.

PALES, or PILES, in *Carpentry*, denote rows of stakes driven deep in the ground to make wooden bridges over rivers, and to erect other edifices on.

Du-Cange derives the word from the Latin name *palla*, a hanging, or piece of tapestry: the ancients gave the name pales to the hangings or linings of walls; thus a chamber was said to be *paled* with cloth of gold, with silk, &c. when covered with bands or stuffs of two colours. Hence also the original of the word pale, a stake, &c. The arms of Arragon are *paled*, or *and gules*.

Tertullian observes, that the Romans planted pales to serve as boundaries of inheritances; and that they consecrated them to the god Terminus, under the name of *pali Terminales*.

Ovid tells us, they were crowned and adorned with flowers, festoons, &c. and that the god was worshipped before these pales. See TERMINALIA.

Pales for building, serve to support the beams which are laid across them, from one row to another; and are strongly bound together with cross-pieces.

PALES, in *Mythology*, the divinity of shepherds, or the tutelary deity and protectress of flocks. Her festival was called *Polilia*, which see.

PALESCIANO, in *Geography*, a town of Naples, in the province of Otranto; three miles S.E. of Motola.

PALESTINE, in *Ancient Geography*, a province of Asia, first called the land of Canaan from Noah's grandson, by whom it was peopled; but since distinguished by other appellations, such as the Land of Promise, the Land of Israel, the Holy Land, and by way of pre-eminence, the Land. It derived its name of Palestine from the Palestinæ, or Philistines, who possessed great part of it; and that of Judea, or Judea-Palestina, from Judah, whose tribe was the most considerable of the twelve, and possessed the finest and most fertile part of the whole. Christians, as well as Jews, have dignified it with the title of "Holy Land;" partly on account of its metropolis, supposed to have been the centre of God's worship, and his peculiar habitation, but chiefly because it was the native country of Jesus Christ, and the scene on which he accomplished the great work of our redemption. See JUDEA and JUDAH.

Palestine was enclosed on the W. by the Mediterranean, and on the E. by the lake Asphaltites, the Jordan, the sea of Tiberias or of Galilee, and the Samachonite lake;

to the N. it had the mountains of Libanus, or rather of Antilibanus, or the province of Phœnicia, and to the S. Edom, or Idumæa, from which it was likewise parted by another ridge of high mountains. This was, strictly speaking, the "Land of Promise." Its extent has been variously assigned; some allowing it no more than 170 or 180 miles in length from N. to S., and 140 in breadth from E. to W. where widest, as it is towards the S., and about 70, where it is narrowest, as it is towards the N. But of late it has been made to extend to nearly 200 miles in length, and about 80 in breadth, about the middle, and 10 or 15, more or less, where it widens or shrinks. In the sacred writings it is represented to have been exceedingly fertile, rich, populous, and powerful. Before the Israelites took possession of it, Moses has described its fertility and productiveness in Deut. viii. 7, &c. And it is said to have exceeded even the celebrated land of Egypt, in the number of cattle which it bred, and in the quantity and excellence of the oil, wine, corn, and various fruits which it yielded. To this wonderful fecundity several circumstances are supposed to have contributed; such as the temperature of its climate, the regularity of its seasons, and the richness of its soil. In order to justify the scripture accounts of this country, it ought to be considered that, in the times to which they refer, it was inhabited by an industrious people, who spared no pains to improve its natural fertility, and to render even its rocks, naturally barren, productive. The fecundity of Palestine has been extolled even by Julian the apostate, the avowed enemy both of Jews and Christians, who frequently mentions the perpetuity, as well as excellence, and great abundance, of its fruits and products. The visible effects of divine displeasure, which this country has experienced, not only under Titus Vespasian, but much more since that emperor's time, in the inundations of the northern barbarians, of the Saracens, and of the more cruel and destructive Christians, during the holy war, and in the oppression it now feels under the Turkish yoke, are causes more than sufficient to have reduced the far greater part of the country into a mere desert. If, indeed, we were to judge by its present appearance, nature itself seems to have rendered it incapable of cultivation. The principal river of Palestine was Jordan. Under the Romans, Palestine began to be divided into tetrarchies and toparchies; the larger were those of Judæa, Samaria, and Galilee, Upper and Lower; the lesser those of Geraritica, Saron, and others of less note, which lay on this side of the Jordan. The rest, on the other side, were those of Gilead, Peræa, Gaulonitis, Auranitis, Batanea, and Decapolis. In the reigns of the Christian emperors, it was divided into Palæstina prima, secunda, tertia, or Salutaris, which last included the far greater part, if not the whole country.

Palestine, in its present state (says Volney), comprehends the whole country included between the Mediterranean to the west, the chain of mountains to the east, and two lines, one drawn to the south, by Kan Younes, and the other to the north, between Kaifaria and the rivulet of Yafa. This whole tract is almost entirely a level plain, without either river or rivulet in summer, but watered by several torrents in winter. Notwithstanding this dryness the soil is good, and may even be termed fertile, for when the winter rains do not fail, every thing springs up in abundance; and the earth, which is black and fat, retains moisture sufficient for the growth of grain and vegetables during the summer. More dourra sesamum, water-melons, and beans, are sown here than in any other part of the country. They also raise cotton, barley, and wheat; but though the latter be most esteemed, it is less cultivated, for fear of too much inviting the avarice of the Turkish governors, and the rapacity of

the Arabs. This country is indeed more frequently plundered than any other in Syria, for being very proper for cavalry, and adjacent to the desert, it lies open to the Arabs, who are far from satisfied with the mountains: they have long disputed it with every power established in it, and have succeeded so far as to obtain the concession of certain places, on paying a tribute, from whence they infest the roads, so as to render it unsafe to travel from Gaza to Acre. They might even have obtained the entire possession of it, had they known how to avail themselves of their strength; but, divided among themselves by jarring interests, and family quarrels, they turn those weapons on each other which they should employ against the common enemy, and are at once enfeebled by their disregard of all good order and government, and impoverished by their spirit of rapacity.

Palestine, says Volney, is a district independent of every Pacha. Sometimes it has governors of its own, who reside at Gaza under the title of Pachas; but it is usually, as at present, divided into three appanages, or *Melkana*, viz. Yafa, Loudd, and Gaza. The former belongs to the *Wald*, or sultana mother. The captain Pacha has received the two others as a recompence for his services, and a reward for the head of Daher. He farms them to an aga, who resides at Ramla, and pays him two hundred and fifteen purses for them, viz. one hundred and eighty for Gaza and Ramla, and thirty-five for Loudd.

PALESTRINA, GIOVANNI PIERLUIGI DA, in *Biography*. It has been frequently observed, that the life of a studious man, whose mind is more active than his body, affords few materials for biography, even if every transaction of his life were known; but at a remote period, when every lineament and trace of character is obliterated, it is with difficulty that the time and place, even of his existence, can be established, or the works enumerated which his genius and diligence have produced. Palestrina, whose works have been so long justly admired, is of this class; for little more has been recorded of his life, than if it had been wholly spent in a hermitage. His birth, however, has been fixed, with some degree of certainty, in the year 1529, at Palestrina, the Præneste of the ancients. Italy being divided into many independent states, each of which has a distinct and separate honour to maintain, the natives are not only very careful in settling the spot where a man of genius was born, but of recording the place where he was educated, with the name of his master; and as the painters of Italy are appropriated to different schools, so are the musicians; and a composer or performer of great abilities is seldom mentioned without his country, by which it is known, that he is of the Roman, Venetian, Neapolitan, Lombard, or Bolognese school, each of which has some peculiar characteristic, that enables one intelligent musician of Italy immediately to discover the school of another, by his works, or performance. To these distinctions the natives of other countries so little attend, that when it is known that a musician comes from Italy, no further enquiry is made.

From this ancient custom of naming the master with the scholar and his country, all the writers of Italy, who have given any account of Palestrina, have thought it necessary to say, that he was a scholar of Gaudio Mell, Flemingo, a Fleming; by whom they have been generally understood to mean Claude Goudimel, a native of Franche-Comté, and a Huguenot, who was one of the first that set the translation of the Psalms, by Clement Marot and Theodore Beza, to music; and who was murdered at Lyons in 1572, on the fatal day of the massacre of Paris.

Who Mell was, if different from Goudimel, we know not; of his works or name we have met with no memorial.

Indeed,

PALESTRINA.

Indeed, as the fact is not of sufficient importance to merit a long discussion, we shall leave it as we found it; for who can be very solicitous to know of what master Palestrina learned the mechanical rules of his art, which were established and very well known, at least a century before his superior genius turned them to so good an account.

However, the few circumstances and outlines of Palestrina's life that have been preserved from oblivion, and seem the most indisputable, are, that he was born in the year 1529; that having distinguished himself as a composer, about 1555, he was admitted into the Pope's chapel, at Rome; in 1562, at the age of thirty-three, he was elected maestro di capella of Santa Maria Maggiore, in the same city; as upon the death of Giovanni Animuccia, in 1571, he was honoured with a similar appointment at St. Peter's; and lastly, having brought choral harmony to a degree of perfection, that has never since been exceeded, he died in the year 1594, at the age of sixty-five.

The following account of his death and burial was entered in the register of the Pontifical chapel by Ippolito Gamboce, Puntatore, who at that time had the care of the records.

"February the 2d, 1594. This morning died the most excellent musician, signor Giovanni Pierloisci, our dear companion, and maestro di capella of St. Peter's church, whither his funeral was attended not only by all the musicians of Rome, but by an infinite concourse of people, when *Libera me Domine* was sung by the whole college." To this account Adami adds that of Torrigio, who says: "In St. Peter's church, near the altar of St. Simon and St. Jude, was interred, in consequence of his extraordinary abilities, Pierluigi da Palestrina, the great musical composer, and maestro di capella of this church. His funeral was attended by all the musicians of Rome, and *Libera me Domine*, as composed by himself, in five parts, was sung by three choirs. Upon his coffin was this inscription: *Joannes Petrus Aloysius Præcellentissimus Musicæ Princeps.*"

It would be useless to transcribe all the eulogia that have been bestowed on Palestrina by musical writers, though he has seldom been mentioned by others; but it is left to artists to take care of their own fame: none but painters have written the lives of painters, or musicians those of musicians. Heroes indeed are consigned to historians; and the learned are seldom negligent of themselves.

Indeed very honourable mention was made of our great contrapuntist during his life-time by Giovanni Guidetto, chaplain to pope Gregory XIII. who being appointed to collate, correct, and regulate the choir service of St. Peter's church, 1582, says that he was unwilling to depend solely on his own judgment in this undertaking, and therefore had applied to that prince of musicians, Giovanni Pierluigi da Palestrina, to superintend and correct the whole work, an office which he was so obliging as to undertake; "and if," says he, "the compilation be found to have any merit, it must be chiefly ascribed to his kind assistance."

Some judgment may be formed, says the learned author of the "Essay on Counterpoint," so often mentioned, of the great veneration in which he was held by the professors of his own time, from a collection of psalms, in five parts, that was published in 1592, and dedicated to Palestrina, by fourteen of the greatest masters of Italy at that time; among these were Pietro Pontio, already mentioned, and Costanzo Porta, who will be distinguished hereafter as a composer, whose abilities, in point of learning and contrivance, are truly wonderful.

By the assistance of signor Santarelli, we procured at Rome a complete catalogue of all the genuine productions

of Palestrina, with the several dates and forms of their publication, title of each work, the name and residence of the printer, which the Italians never fail to record. These are classed in the following manner: Masses in four, five, and six parts, twelve books; of which lib. i. appeared at Rome in folio, 1554, when the author was in the twenty-fifth year of his age; and in that city only went through three several editions during his life. Lib. ii. of his masses, which includes the celebrated composition entitled "*Missa Papæ Marcelli*," was published likewise at Rome, in 1567. Of this production it has been related by Antimo Liberati, in the letter above cited, and after him by Adami, Berardi, and other musical writers, that the pope and conclave having been offended and scandalized at the light and injudicious manner in which the mass had been long set and performed, determined to banish music in parts entirely from the church; but that Palestrina, at the age of twenty-six, during the short pontificate of Marcellus Cervinus, intreated his holiness to suspend the execution of his design, till he had heard a mass, composed in what, according to his ideas, was the true ecclesiastical style. His request being granted, the composition, in six parts, was performed at Saller, 1555, before the pope and college of cardinals; who found it so grave, noble, elegant, learned, and pleasing, that music was restored to favour, and again established in the celebration of sacred rites. This mass was afterwards printed, and dedicated to the successor of Marcellus, pope Paul iv. by whom Palestrina was appointed maestro di capella to the pontifical chapel.

The rest of his masses appeared in the following order: Lib. iii. *Romæ per Valerium Doricum*, 1570, in folio. Ven. 1599. Lib. iv. *Venet. per Ang. Gardanum*, 1582, quarto. Lib. v. *Romæ*, 1590. Lib. vi. Ven. 1596. Lib. vii. 1594. Lib. viii. and ix. Ven. 1599. Lib. x. and xi. Ven. 1600. And lib. xii. without date, or name of the printer. Besides this regular order of publication, these masses were reprinted in different forms and collections, during the sixteenth and seventeenth centuries, in most of the principal cities of Italy; of which editions we were furnished with memoranda.

The next division of Palestrina's works consists of Motets for five, six, seven, and eight voices, five books, at Rome and Venice, 1569, 1588, 1589, 1596, and 1601. Motets for four voices, lib. i. *Romæ*, 1590. Lib. ii. Venet. 1604. Two books of Offertories, a 5 and a 6 voc. *Romæ*, 1593. Lamentations, a 4 voc. *Romæ*, 1588. Hymns for five voices, Ven. 1598. Litanies, a 4, Ven. 1600. Magnificat, 8 tomum. *Romæ*, 1591. Madrigals Spirituali, two books, Rome and Venice, 1594.

To the above ample list of the works of this great and fertile composer, are to be added, *La Cantica di Salomone*, a 5; two other books of Magnificats, a 4, 5, & 6 voc. One of Lamentations, a 5; and another of secular Madrigals. These have been printed in miscellaneous publications after the author's death; and there still remain in the Papal chapel, inedited, another mass, a 4, upon the hexachord, *ut, re, mi, fa, sol, la*; with his *Missa Defunctorum*, a 5, and upwards of twenty motets, chiefly for eight voices, *à due cori*.

Nothing more interesting remains to be related of Palestrina, than that most of his admirable productions still subsist. Few of his admirers are indeed possessed of the first editions, or of all his works complete, in print or manuscript; yet curious and diligent collectors in Italy can still, with little difficulty, furnish themselves with a considerable number of these models of counterpoint and ecclesiastical gravity.

If we consider the operose and flow manner in which works of this kind are conducted, from the many real parts they contain, and of which some are generally moving in canon, and the rest always in fugue, we shall be as much astonished at the number of his productions, as pleased with their effects. Indeed the works of Aristotle, Cicero, or the elder Pliny, among the ancients, or of Fabricius, among the moderns, were hardly more numerous. With the union, indeed, of great erudition and great industry we are not surpris'd; but genius is not often so voluminous.

Palestrina having brought his style to such perfection, that the best compositions, which have been produced for the church since his time, are proverbially said to be *alla Palestrina*, it seems as if this were the place to discuss its merit.

Though good taste has banished fugue, canon, and elaborate compositions from dramatic music, yet sound judgment has still retained them in the church; to which, from the little use that is made of them elsewhere, they are now in a manner appropriated. Indeed there seems no more impropriety in their being occasionally used in the chamber, than private prayer or family devotion. It is the church and stage which we wish to be wholly separated; for it has long appeared to us, that whoever lightly brings the rites of the church to a theatre, or theatrical levity to the church, is guilty of want of taste, judgment, and due reverence for the religion of his country.

In the compositions of Palestrina there is, indeed, no unity of melody; but as all the parts have an equal share of importance, and as hardly a note appears in them without some peculiar intention and effect, they cannot, like the *remplissage* of a modern concerto or opera song, be composed with as much rapidity as they could be transcribed; little invention and few flights of fancy are required; yet there is a degree of happiness and genius in finding a few uncommon notes that are favourable to fugue and canon, as well as in creating new and graceful passages in melody. Indeed both the choral and secular style have their peculiar difficulties, beauties, and defects.

Whoever is accustomed to the vocal fugues of Palestrina, Carissimi, or Handel, will be fastidious with respect to those of other composers of equal learning. Preaching upon a text has been called a Gothic contrivance; and yet what admirable lessons of piety and virtue have been produced under the denomination of sermons! Fire, genius, and harmonical resources are discoverable in fugues, as well as in modern songs, solos, or concertos: a musical student, therefore, unacquainted with the laws of fugue, is advanced but a little way in composition; as the hearer, who receives no pleasure from ingenious contrivance and complicated harmony, is but a superficial judge. Our wish is to resolve the discords of contention, to augment the pleasure of both parties, and extend the compass of their views; that, like the music composed *à deux cori*, the friends of harmony and melody may *agree*, though performing different parts, at a distance of each other, and to terminate this long article concerning the most venerable patriarch of choral music, of whose style it has always appeared to us, that notwithstanding its general gravity and elaboration, that genius glows in all his productions, in spite of the trammels of *canto firmo*, canon, fugue, inversions, diminutions, augmentations, double counterpoint, or whatever would chill or petrify any other than himself.

It is hoped, therefore, that no apology will be necessary for the length of this article, which "the reader can make as short as he pleases." In a general history of ancient poetry, Homer would doubtless occupy the most ample and honourable place; and Palestrina, the Homer of the

most ancient music that has been preserved, merits all the reverence and attention, which it is in a musical writer's power to give.

PALESTRINA, in *Geography*, one of the islands near the city of Venice, 12 miles long, but narrow. Its market-town is of the same name and large, containing above 7000 inhabitants; six miles S. of Venice.—Also, a town of Italy, in the province of Campagna, anciently "Præneste," (which see,) the see of a bishop; 18 miles E.S.E. of Rome. N. lat. 41° 51'. E. long. 12° 49'.

PALESTRIUM, a town of European Turkey, in Livadia; 34 miles N. of Lepanto.

PALETTE, CAPE, a cape on the S. coast of the island of Celebes, in Bony bay. S. lat. 3° 20'. E. long. 120° 48'.

PALEY, WILLIAM, in *Biography*, a justly celebrated divine and philosopher, was born at Peterborough, in July 1743, of the cathedral church of which place his father was a minor canon. Soon after the birth of his son he was appointed head-master of Giggleswick school, in Yorkshire, to which place he removed. Young Paley was now educated under his father's eye; at school he soon surpassed his contemporaries, and at length obtained a pre-eminence over them all. He was even at this period more attentive to things than to words, and was ardent in the pursuit of knowledge of every kind. He was very curious in his enquiries about mechanism, whenever he had an opportunity of conversing with any workmen, or others capable of affording him information. In his *mind* he was uncommonly active; in his *body* quite the reverse.

Soon after he had completed his fifteenth year he accompanied his father to Cambridge, and was admitted a sizar of Christ's college, November 16th, 1758. Soon after his return, as the classics alone were taught at his father's school, he went for mathematical instruction to Mr. William Howarth, a teacher of some eminence at Dishforth, near Topcliffe, three miles from Rippon, under whose care he laid an excellent foundation of knowledge in algebra and geometry. In October 1759, he became a resident member of Christ's college, and on the 5th of December he was appointed to one of the scholarships founded by Mr. Carr; was elected a scholar on the foundation of his college, and appointed to the exhibition founded by sir Walter Mildmay. At college he distinguished himself by his diligence and great proficiency, and attracted considerable notice in the university, at the first opportunities which he enjoyed of displaying his talents in the public schools. In 1763 he was admitted to the degree of B. A. having had the honour of appearing the first man of his year in the previous examinations.

After he had become a graduate, Mr. Paley was engaged as second assistant in an academy at Greenwich, kept by Mr. Bracken, and chiefly resorted to by young men intended for the army and navy, where his department of teaching was in the Latin language. He retained this situation about three years. In 1765 he became a candidate for one of the prizes given annually by the representatives of the university of Cambridge to senior bachelors, to the authors of the two best dissertations in Latin prose. The subject proposed was "A comparison between the Stoic and Epicurean philosophy, with respect to the influence of each on the morals of a people." Mr. Paley took the Epicurean side, and obtained the first prize.

Being ordained a deacon, at a proper age, he engaged himself as curate to Dr. Hinchliffe, then vicar of Greenwich, and afterwards bishop of Peterborough. Soon after this he left the academy, but continued to officiate in the church.

church. In June 1766, he was elected a fellow on the foundation of Christ's college, which was worth about 100*l. per annum*, in consequence of which he returned to a residence in the university, took his degree of master of arts, and engaged in the business of private tuition, which was soon followed by his appointment to the office of one of the college tutors. On the 21st of December 1767, he was ordained a priest by bishop Terrick.

The duties of college tutor Mr. Paley discharged with uncommon assiduity and zeal. Not contented with following the usual method of college-lectures, by which the progress of a student is left to depend chiefly on his own industry, or private assistance, he endeavoured to introduce his pupils to an acquaintance with the most important truths, by arguments and illustrations, which were equally pleasing and forcible. His lectures on moral philosophy, and on the Greek Testament, contained the outlines of the works, by which he afterwards so much benefitted the world, and extended his own reputation; and those works may be said to have owed their origin to the situation, which imposed upon him the duty of delivering the lectures. Mr. Paley at this time acted in conjunction with Dr. John Law, the late bishop of Elphin, and son of the celebrated bishop of Carlisle. The exertions and talents of these kindred souls rendered Christ's college extremely popular; and while they retained their offices, that society rose to a flourishing state, unequalled, perhaps, in the history of the university. Mr. Paley maintained an intimate acquaintance with almost every person of celebrity in the university. Among his most particular friends were Dr. Waring, and Dr. John Jebb, well known by his talents, his integrity, and his zeal in religious and political controversy. Through his friendship with Dr. Law, he became intimately acquainted with his father, Dr. Edmund Law, who was master of Peter-house, and who continued chiefly to reside in the university, after he was created bishop of Carlisle. The learned prelate's theological opinions fell greatly below the established standard of orthodoxy, and Dr. Jebb's sentiments were equally obnoxious to the zealous friends of the church; on the same account, of course the intimate friendship that subsisted between these learned men and Mr. Paley was viewed with a jealous eye by many, who were closely attached to the established systems. Because he was liberal, he was suspected to be a latitudinarian, and they were prepared to discover dangerous tendencies in his moral and political speculations, should they ever be given to the public. After Mr. Paley had spent about ten years as college tutor, he quitted the university in 1776, and married. His first benefice in the church was the rectory of Musgrove, in Westmoreland, worth only about eighty pounds a-year: this was in the month of May 1775, and in December 1776, he was inducted into the vicarage of Dalton, in Cumberland, after which he was presented to the living of Appleby, in Westmoreland, worth about 300*l. per annum*. and in a short time he was promoted to a prebendal stall in the cathedral church of Carlisle.

While vicar of Appleby, he gave the world a small volume selected from the Book of Common Prayer, and the writings of some eminent divines, entitled "The Clergyman's Companion in visiting the Sick." This was first published without his name, but it has passed through many editions, and is now printed among his works. The professional usefulness of this book to the clergy, is no small recommendation of its merits, but when considered as originating in Mr. Paley's personal attention to the spiritual wants of his own flock, it affords an additional proof of his value as a parochial minister.

In the year 1782, upon the resignation of Dr. John Law, who was created an Irish bishop, Mr. Paley was made archdeacon of the diocese, and not long after he succeeded Dr. John Burn, author of "The Justice of Peace," in the chancellorship. For these different preferments he was indebted either to the venerable bishop of Carlisle, or to the dean and chapter of the cathedral church. While his residence was divided between Carlisle and Dalton, Mr. Paley engaged in the composition of his celebrated work, "The Elements of Moral and Political Philosophy." This production would probably have never seen the light, had not the instigations of Dr. John Law urged him to the undertaking. Mr. Paley for a considerable time objected to the risk of publishing, imagining there would be but few readers for a work on that subject, and he was the more determined on this point after he had entered on the married state, thinking it a duty that he owed his family, not to print a book that would probably not find purchasers. To remove the objection, a living having become vacant, of which Dr. Law had the disposal, he presented it to Mr. Paley, on the promise that he would consider it as a compensation for the hazard of printing, and he immediately set about preparing his work for the press. When the MS. was completed, he offered it to Mr. Faulder for 300*l.*, which he refused, proposing 250*l.* as the full value; in the mean time the author was offered by another person in the trade 1000*l.* for the copy-right; he felt it his duty to give Mr. Faulder the refusal, rising however in his demands from 300*l.* to 1000*l.* which the publisher agreed to pay. In 1785 the work was brought out in 4to. with an excellent dedication to the bishop of Carlisle, bearing honourable testimony to the purity of the motives by which that prelate was actuated in his religious researches, and avowing sentiments which reflect the highest credit on the author's ingenuity and liberality. "Virtue," says Mr. Paley, "is the doing good to mankind, in obedience to the will of God, and for the sake of everlasting happiness." The good of mankind, therefore, is the subject, the will of God the rule, and everlasting happiness the motive of human virtue. All obligation consists in being urged by a violent motive resulting from the command of another. As the will of God, then, is the rule, to enquire what is his duty, or what man is obliged to do in any instance, is, in effect, to enquire what is the will of God in that instance, which consequently becomes the whole business of morality. There are two methods of coming at the will of God, *viz.* by having recourse to the *scriptures*, or to the *light of nature*. The tendency of any action to promote or diminish the general happiness, is the criterion for ascertaining the will of God by the light of nature; since the many proofs of benevolence apparent in the works of creation warrant the conclusion, that *He* wills the happiness of his creatures, and that those actions are agreeable to him, or the contrary, which promote or frustrate that effect. Actions in the abstract, then, are right or wrong according to their tendency. Whatever is expedient is right. It is the utility of any moral rule alone that constitutes the obligation of it. The expediency of any action, however, must be eliminated by general rules, and in reference to all its remote consequences, as well as those that are immediate and direct. Right and obligation are reciprocal, for wherever there is right in one person, there must be a corresponding obligation upon others: and since *moral obligation* depends upon the will of God, *right*, which is correlative to it, must depend upon the same. *Right*, therefore, signifies *consistency with the will of God*. Such is the outline of our author's theory, which, from its great popularity, we have thought it right to state under the article

of the author, who has given to it so much celebrity. Concerning the merits of this work, we may say in the words of an able critic, "those who are fond of novelty, of ingenious theories, curious speculations, abstract and metaphysical notions, will find indeed little in it to amuse or entertain them; but those who are solicitous to have their consciences properly directed in the general conduct of human life, to see their duties and obligations delineated with perspicuity and accuracy, will be fully gratified." His reasoning on subscription to articles of religion; and on the British constitution, in which he disputes the expediency of reform in the house of commons, and vindicates the undue influence of the crown in that branch of parliament, is liable to great objection, and has been attacked, deservedly and severely, by persons of considerable reputation in the literary world. "It may, however," says Mr. Meadley, "he esteemed the last effort of an ingenious mind to soften by interpretation the rigour of practice, which he could not seriously approve; and so to enlarge the pale of conformity to liberal and conscientious men." Mr. Paley's casuistry, in this instance, on the nature and extent of obligation incurred, may be most effectually answered by his own better reasoning on the propriety of subscription, in his "Defence of Bishop Law's Considerations," and in this chapter, "of religious establishments and of toleration, in the present work." "In the one case," says Dr. Diney in the works of Jebb, "he seems to betray the yoke of bondage, in the display of a very feeble apology; in the other he resumes somewhat more of his Christian liberty, and recollects the principles of his Protestant faith."

On the death of the venerable bishop of Carlisle in 1787, Mr. Paley drew up a short memoir of him, which has been inserted in Hutchinson's History of Cumberland, and in the Encyclopædia Britannica, and which, in 1803, was prefixed, with notes supposed to have been written by the Rev. Dr. Diney, to an edition of the bishop's Reflections on the Life and Character of Christ, intended for popular circulation.

The next work which Mr. Paley presented to the public, places him in a high rank among the advocates for the truth and authenticity of the Christian scriptures. It is entitled "Horæ Paulinæ; or, the Truth of the Scripture History of St. Paul evinced, by a comparison of the Epistles which bear his name, with the Acts of the Apostles, and with one another," which he dedicated to his friend Dr. Law, at that time bishop of Killala. The grand object of this work is to shew, that by a comparison of several indirect allusions and references in the Acts and Epistles, independently of all collateral testimony, their undesigned coincidence affords the strongest proof of their genuineness, and of the reality of the transactions to which they relate. Instead of requiring the truth of any part of the apostolic history to be taken for granted, he leaves the reader at liberty to suppose the writings to have been lately discovered, and to have come to our hands destitute of any extrinsic or collateral evidence whatever. The design was original, and the execution admirable. Notwithstanding the title, the utility of the work was not confined to the learned: the "Horæ Paulinæ" will furnish the common reader, as well as the biblical student, with ingenious criticisms and remarks, which will afford valuable assistance in the right understanding of St. Paul's epistles. See *ACTS of the Apostles*.

Soon after the appearance of this work, Dr. Yorke, bishop of Ely, made an offer to Mr. Paley of the mastership of Jesus college, Cambridge, in which the worthy prelate was solely influenced by the reputation of Mr. Paley's extraordinary talents, and by a wish to render them serviceable

in a high academical situation. After deliberate consideration he declined the honour intended him, but his sense of gratitude for his lordship's kindness he publicly expressed in a dedication prefixed to his work, which he published in 1794, and which is entitled "A View of the Evidences of Christianity, in three Parts; I. Of the direct historical Evidence of Christianity, and wherein it is distinguished from the Evidence alleged for other Miracles. II. Of the Auxiliary Evidences of Christianity; and, III. A brief Consideration of some popular Objections. This work was first published in three volumes, 12mo. but in a few months it was republished in two volumes, 8vo. and has been continued in this form through many successive editions. It is perhaps the most complete summary of the evidences of our holy religion that has ever appeared. It also possesses a merit of offering a defence of Christianity, which every Christian may read without seeing the tenets, peculiar to the sect to which he is attached, in the least decried.

After the publication of the "Evidences of Christianity," the bishop of London, Dr. Porteus, instituted him to the prebend of St. Pancras, in the cathedral of St. Paul's. This was in August 1794, and in a very short time he was promoted to the subdeanery of Lincoln, a preferment of 700*l. per ann.*, by Dr. Prettyman, bishop of that diocese. In January 1795 he proceeded to Cambridge to take his degree of D.D. and before he left that place, he was surprized by a letter from the bishop of Durham, Dr. Barrington, with whom he had not the smallest acquaintance, offering him the valuable rectory of Bishop-Wearmouth, estimated at twelve hundred pounds a-year. When he waited on his new patron to express his gratitude, his lordship instantly interrupted his acknowledgments; "Not a word," said he, "you cannot have greater pleasure in accepting the living of Bishop-Wearmouth, than I have in offering it to you." After reading himself in, as a prebend, at St. Paul's cathedral, March 8th, Dr. Paley, for he now assumed that title, immediately proceeded to Bishop-Wearmouth, took possession of his valuable cure, and then returned to Cambridge against the Commencement, to complete the Doctor's degree, and on Sunday July 5th, preached before the university his sermon "On the Dangers incidental to the clerical Character." From this time he divided his residence principally between Lincoln and Bishop-Wearmouth, spending his summers at the latter, and his winters at the former of those places. At Bishop-Wearmouth the principal landowners, wishing to remove even the probability of future dispute, offered him an annual compensation for the tythes. He readily acquiesced, and granted them leases for his life, and thus, by sacrificing any eventual interest of his own in the agricultural improvement of the parish, avoided one great source of inquietude and vexation. In his writings he had already reprobated tythes as noxious to cultivation and improvement, and recommended their conversion into corn-rents, as a practicable and beneficial alteration, in which the interest of all parties might be equitably adjusted; and he now acted in strict conformity to these principles, leaving to the industry of his parishioners its full operation and entire reward. He next undertook the composition of his last work, entitled "Natural Theology; or Evidences of the Existence and Attributes of the Deity, collected from the Appearances of Nature." In this he proceeded very slowly, and was much interrupted by ill-health.

This work was published in the summer of 1802; it was dedicated to the bishop of Durham, for the purpose of making the most acceptable return he was able for a great and important benefit conferred upon him. "A weak, and of late, a painful state of health," he says, in his dedication,

“deprived me of the power of discharging the duties of my station, in a manner at all suitable either to my sense of those duties, or to my most anxious wishes concerning them. My inability for the public functions of my profession, among other consequences, left me much at leisure. That leisure was not to be lost. It was only in my study that I could repair my deficiencies in the church. It was only through the press that I could speak. These circumstances, in particular, entitled your lordship to call upon me for the only species of exertion of which I was capable, and disposed me, without hesitation, to obey the call in the best manner that I could. In the choice of a subject I had no place left for doubt:—the following discussion alone was wanted to make up my works into a system; in which works, such as they are, the public have now before them, the evidences of natural religion; the evidences of revealed religion, and an account of the duties that result from both.”

In this admirable work the author has traced and shewn the marks of wisdom and design in various parts of the creation; but he has dwelt principally on those which may be discovered in the constitution of the human body. From nature and man he has advanced to Nature's God, and by a train of argument and illustration, equally forcible and beautiful, he has established the most satisfactory evidence of the personality, natural attributes, unity and goodness of the Deity.

Mr. Meadley, to whose work we are greatly indebted for the facts in this article, says, he saw him for the last time in December 1804. His valuable life was then drawing fast towards a close; and the powers of nature, gradually exhausted by repeated sufferings, were becoming daily less able to resist the force of his disease. At length, on his return from his annual residence at Lincoln early in the month of May 1805, he experienced a very violent attack, in which the usual remedies were found ineffectual. He soon sunk under the accumulated influence of debility and disease. He met the approach of death with firmness, comforted his afflicted family with the consolation of that religion which he had so successfully taught, and on Saturday May 25th 1805, he breathed his last. His remains were conveyed to Carlisle, and were interred in one of the aisles of the cathedral by the side of his first wife, by whom he had eight children, viz. four sons and four daughters. His second wife survived him.

In private life Dr. Paley had nothing of the philosopher about him. He entered into little amusements with a degree of ardour, which, when contrasted with the superiority of his mind, had a pleasing effect, and constituted a very amiable trait of his character. He was fond of company, which he had extraordinary powers of entertaining; nor was he, at any time, more happy than when communicating the pleasure he could give, by exerting his unrivalled talents of wit and humour. No man was ever more beloved by his particular friends, or returned their affection with greater sincerity and ardour. As a divine, the great aim of Dr. Paley's labours was to maintain the authority of the gospel, as an authentic revelation, and to enforce the practice of virtue by the sanctions of a future life. His views of the Christian system were at once cheerful and enlightened, and in strict unison with the benevolent spirit of the founder. It is generally understood that Mr. Pitt did once recommend him to his majesty for a vacant bishopric, and that an opposition was made from a very high quarter of the church, which rendered the recommendation ineffectual. Mr. Meadley has endeavoured to account for this obstruction to royal patronage, and he presumes that the promotion of Mr. Paley was impeded by “the freedom of his manner in the story of

the pigeons:—by his liberal construction of the oath of allegiance:—by his assertion that the government may be too secure:—by his limitation of the duty of civil obedience:—by his argument that the obligation of subjects and sovereigns is reciprocal:—by his just and striking remark that the divine right of kings is like the divine right of constables; and still more by his enlightened views of religious establishments and toleration.” But whatever was the cause, it was not creditable to the age, that such a man, who had laboured so hard in the cause of religion, natural and revealed, and of pure morality, should not have been raised to the highest rank in the church.

As a writer, Dr. Paley is not remarkable for what is called fine writing, though in this he could excel, as is evident from certain parts of his “Moral Philosophy,” and the conclusion of the “Natural Theology,” which contains some passages scarcely to be excelled in the English language. He had higher objects in view; he wished to inform the understanding, and impress the heart with important truth, and for these purposes his style and method are admirably adapted. The general characteristics of his writings are plainness and simplicity; but there is, at the same time, both in his language and his ideas, a peculiarity of manner stamped by the vigour and independence of his mind, which cannot be borrowed, and which will therefore perpetuate his reputation. Dr. Paley was author of several other works besides those referred to: of these Mr. Meadley has given a complete catalogue. Since his death a collection of thirty-five sermons has been published. In compliance with a codicil to his *Will*, they were at first printed and given away among the inhabitants of Bishop-Wearmouth. His family have since acquiesced in the general wish, and presented them to the world, as it would not have been possible to have prevented a surreptitious sale of them. Monthly Magazine; New Annual Register; and Meadley's *Memoirs of William Paley, D.D.* particularly the latter, we refer to as our authorities.

PALFA, in *Geography*, a town of the duchy of Stiria; 18 miles N. of Leoben.

PALFREYS, PALFREDI, *Palafredi, Palefridi*, were an elegant and easy sort of horses, which, for their gentleness and agreeable paces, were used upon common occasions by military persons and others: their pleasing qualities soon recommended them to the fair sex, who, having no coaches, used these palfreys, and always travelled on horseback. Camden says, that W. de Fauconberge held the manor of Cukeny, in the county of Nottingham, in serjeantry, by the service of shooing the king's palfrey, when he came to Mansfield. Co. Lit. 149.

PALFYN, JOHN, in *Biography*, a surgeon and anatomist of reputation, was born at Courtray, in Flanders, in 1649, or the following year. He settled in the practice of his profession, at Ghent, where he obtained considerable reputation, and gave lectures to a number of pupils. Being extremely zealous for improvement, he visited Paris annually, and occasionally went to Leyden, and even to London, to learn the novelties which were acquired in the practice of his art, in these great schools of medicine. He was the contriver of several improvements in the form of chirurgical and obstetrical instruments, and the author of several useful treatises on anatomy and surgery, which obtained considerable popularity. He died at Ghent in the year 1730, at the advanced age of eighty years.

His first work, published at Ghent in 1701, was a treatise on “*Osteology*,” in Flemish, which was afterwards much enlarged by himself, and translated into German and French. It is particularly full relative to the bones of the head, and

was cited with approbation by some of the most eminent professors of the time. In 1708, he published his "Description Anatomique des Parties de la Femme qui servent à la Generation," together with Licetus' treatise on monstres, and a description of one born at Ghent in 1703. This work is chiefly a compilation; but he has given some original observations on the course of the blood in the fœtus, and on monstres. In 1710, he printed his "Anatomic Chirurgicale, ou Description exacte des Parties du Corps humain, avec des Remarques utiles aux Chirurgiens dans la Pratique de leur Art," in French; and in 1718, reprinted it in Flemish. It was regarded as a valuable work, and was republished after his death, in France, Italy, and Germany, Palfyn also translated the treatise of Anthony Petit on "Diseases of the Eyes," into Flemish, adding several other tracts on the same subject. Eloy Dict. Hist. Gen. Biog.

PALGUNGE, in *Geography*, a town of Bengal; 22 miles S. of Currackdeagh. N. lat. 24° 3'. E. long. 86° 20'.

PALIACUR, a town of the island of Ceylon, situated in a bay on the W. coast; 80 miles N.N.W. of Trincomaly. N. lat. 9° 33'. E. long. 80° 14'.

PALIAPADA, a town of Hindoollan, in the Carnatic; 15 miles S.S.W. of Polore.

PALIAR, a river of Hindoostan, which runs into the bay of Bengal; four miles S. of Sadras.

PALIBOTHTHA, in *Ancient Geography*, a very considerable town of India, both with regard to extent and wealth, situated on the right bank of the Ganges (intra Gangem), and at the confluence of a large river with it, which river Arrian calls "Erranobos," inferior to none but the Ganges and Indus, and which Pliny denominates Jomanes (Jumnah). This ancient author says, in one place, that the Jomanes entered the Ganges by Palibothra, between Methora and Clisobara or Caryobara: but in another place he mentions the conflux of the Ganges and Jomanes, and in the next article says, that Palibothra is situated 425 miles below that point of conflux. Pliny's Palibothra, says major Rennell, is clearly Patna; and it is probable that Strabo meant the same place, by the distance from the mouth of the Ganges. Palibothra was the capital of the Prasii, and in dimensions 80 stadia in length and 50 broad, or about ten miles long and nearly two wide.

PALICAUDCHERY, in *Geography*, a town of Hindoostan, in the country of Calicut, taken from Hyder Ali, in 1783, by the British, afterwards evacuated, and at the peace ceded to the English; 26 miles S.W. of Coimbatore. N. lat. 10° 58'. E. long. 76° 45'.

PALICE GREEN, incorrectly written *Palice* or *Pallas Green*, a small post-town of the county of Limerick, Ireland. It is situated at the foot of *Knock-Green*, the hill of the sun, which is remarkable for its basaltic pillars, about a mile from the village, towards Limerick, near the house of Mr. Apjohn. These pillars, though much inferior to those in the county of Antrim, are calculated to arrest the attention of the traveller, and have led to an examination of the hill, and of other parts of the county, which will probably be laid before the public. Palice Green is 12½ miles E. of Limerick, and about 96 miles S.W. from Dublin.

PALICI DII, in *Mythology*, were the sons of Jupiter by the nymph Thalia. The inhabitants of Sicily adopted these for their deities, and in honour of them erected a magnificent temple at Palica. Their altar became the asylum of the unhappy, and particularly of fugitive slaves. In this temple, according to Diodorus, the most important affairs were transacted, and the most severe punishment was inflicted on perjury.

The worship of the gods Palici is said to have been derived from Phœnicia, and their name, according to Bochart, comes from the Hebrew word "Palichin," of *palach*, colere or venerari, and signifies Venerable; which the poet Æschylus, from whom Macrobius has borrowed the fable of their origin, seems to insinuate, when he said Jupiter ordered the gods Palici to have the title of venerable given to them. However this be, the Palici were very much honoured in Italy; and Diodorus assures us, that they had a temple near the city Erice, revered both for its antiquity, and for the wonderful things that happened in it. Accordingly we are told by Macrobius, after Æschylus and Diodorus, that near this temple were two small lakes of boiling and sulphurous water, always full without overflowing, which were called "Delli," and held in the highest veneration by the credulous people, who imagined that they were the brothers of the Palici, or rather that this was the place whence they themselves had sprung, when their mother delivered them. Ovid likewise describes them. (Met. l. 5. 405.) It was near these two pools that solemn oaths used to be made, and controversies determined, which could not otherwise be easily decided. Those who were called to take this oath purified themselves; and after having given security to pay, if the gods condemned them, they approached the pools, and swore by the divinity who presided over them. If this oath was sincere, they went off unhurt; but perjurers were punished upon the spot, as all authors, who have mentioned it, are agreed.

"Perque lacus altos et olentia sulphure fertur
Stagna Palicorum, ruptâ ferventia Terrâ."

Ovid. Met.

"Et qui præfenti domitant perjura Palici
Pectora supplicio."

Sil. Ital.

But they are not quite agreed as to the nature of the punishment. Macrobius asserts that they fell into one of the lakes, and were drowned; Polemon says, that they died suddenly; Aristotle and Stephanus say they were consumed by a secret fire; and according to Diodorus, some of them lost their lives. As the custom of these oaths came from the east, as well as the worship of the gods Palici, it is not improbable that it was an imitation of what is recorded in the book of Numbers, concerning the trials of the water that was given adulterous women to drink; and the punishments above mentioned were merely a tradition of what befel those who were guilty of the crime of which they were accused. The temple of the Palici was also venerable on account of the prophecies that were delivered there from time to time. Macrobius, after Xenagoras, tells us that Sicily being distressed with famine, they consulted the oracle of the Palici, and were answered, that if they sacrificed a certain hero, whom authors have not named, the famine would cease; which accordingly happened. The Sicilians, in acknowledgment of this blessing, heaped fruits and presents upon the altars of these propitious deities; and this, according to Macrobius, has induced Virgil to say,

"Pinguis ara Palici."

The superstition was afterwards carried to such an extreme, that human victims were offered to these gods; but this barbarous custom was afterwards abolished, and the Palici contented themselves with common offerings. To this the above-mentioned poet alludes, when he says,

"Placabilis ara Palici."

PALICONDA, in *Geography*, a town of Hindoostan,
M 2 in

in the Carnatic; 24 miles W. of Arcot.—Also, a town of Hindoostan, in Travancore; 55 miles N. of Anjenga.—Also, a town of Hindoostan, in the circar of Gooty; 20 miles W. of Gooty.

PALICOURÉA, in *Botany*, Aublet. Guian. v. 1. 172. t. 66, a *shrub* seven or eight feet high, whose wood is white, hard, and brittle, the *branches* opposite, forming a pyramidal head. The *leaves* are opposite, on short stalks, oval, entire, pointed, about a foot long and five inches wide, smooth, with a principal longitudinal rib, and numerous parallel transverse ones. *Stipulas* ovate, in pairs, combined with the base of each *leafstalk*, at its inner side, so as all together to embrace the branch. *Panicles* large, terminal, solitary, repeatedly branched, of numerous fragrant scarlet *flowers*, with orange tubes. *Calyx* superior, small, with five sharp teeth. *Corolla* of one petal, funnel-shaped, curved; its limb in five acute segments, the two lower ones smallest. *Stamens* five, their filaments capillary, inserted about the middle of the tube, and extending as far as its orifice; anthers incumbent, oblong, with a longitudinal furrow. *Germs* inferior, roundish, crowned with a glandular disk; style slender, as long as the corolla; stigmas two, spreading, linear, flat, acute. The young *fruit* appeared to consist of two cells, with one seed in each.

Such is Aublet's account of his *P. guianensis*, the only species, which he found in the woods of Guiana, in the district named *Caux*, flowering in February. No explanation is given of the name. Justieu suspects this plant to be of the same genus as the *Simira* of Aublet, t. 65, and his *Mappouria*, t. 67. Willdenow has, very properly in our opinion, referred them all to **PSYCHOTRIA**. (See that article hereafter.) Schreber however has made a genus of the *Palicourea*, by the name of *Stephanium*, from στεφανος, a garland or ornamental crown, on account, as it should seem, of the beauty and brilliancy of the flowers; Schreb. Gen. 124. He records, in his appendix §22, that Dr. Solander had reduced this shrub to *Muffenda*; but the description of the fruit by no means countenances such a decision.

PALIFISCO, in *Geography*, a town of Naples, in Lavora; 5 miles N. of Sezza.

PALIPHERY, a town of Hindoostan, in the circar of Cuddapa; 24 miles W. of Cuddapa.

PALILIA, a feast among the ancient Romans in honour of the goddesses Pales.

The Palilia, by some called *Parilia*, were celebrated by the shepherds on the day of the foundation of Rome, which, according to Cato, was the 11th of the calends of May, that is, the 21st of April; to beseech that goddesses to take care of their flocks, and preserve them from wolves and diseases. On that day the people purified themselves, and also their folds and flocks with water and brimstone, and burned the shrub, called Savine, whose smoke diffused itself all over the fold. After this, they offered in sacrifice to the goddesses milk, boiled wine, and millet: then followed the feast.

Part of the ceremony consisted in lighting heaps of straw, and jumping over them. Ovid (de Fest. l. iv. 721, &c.) describes this whole solemnity at full length. These ceremonies were accompanied with musical instruments, such as flutes, cymbals, and tabours, which played all the day long.

PALILICIUM, in *Astronomy*, a fixed star of the first magnitude in the Bull's eye; called also *Aldebaran*.

Pliny gives the name Pallicium to the Hyades, of which the Pallicum is properly only one. See **TAURUS**.

PALIMERDI, in *Geography*, a town of Hindoostan, in Madura; 35 miles N.N.E. of Coilpetta.

PALINCOTOS, a term used by Hippocrates to express such diseases as are wont to return with all their violence upon

the patient, after their seeming to have left him, whether for a longer or shorter period of time.

PALINDI, in *Geography*, a town of Hindoostan; 45 miles N. of Travancore.

PALINDROMIA, a term used by Hippocrates, and many other writers, to express a preternatural running of the peccant matter of diseases to the more noble parts.

PALINDROMUS, παλινδρομος, *retro currens*, running backward, formed of παλιν, again, and δρομος, course, a verse, or sentence, which reads the same, when read either backwards or forwards.

Such is the verse,

“Roma tibi subitō motibus ibit amor.”

Some people of leisure have refined upon the palindromus, and composed verses, each word whereof is the same backwards as forwards. As that instance in Camden:

“Odo tenet mulum, madidam mappam tenet Anna.”

“Anna tenet mappam madidam, mulum tenet Odo.”

PALING, or **PALEING**, in *Agriculture*, &c. a kind of fence-work for fruit-trees, &c. planted in fields, &c.

It consists of three small posts driven into the ground, at a foot and a half distance; with cross bars nailed to each other, near the top.

In fixing the pales, in form of a triangle, room is to be left for the tree to play and bow by the high winds without galling. The trees are to be bound to a stake for a year or two; after which fern or straw may be stuffed in betwixt the tree and uppermost rails, to keep it upright.

If the pale be open to deer, rabbits, or the like, a post is to be nailed to the bar between every two pales.

PALING-Fence, that sort of fence which is constructed with pales. See **FENCE**.

PALINGENESIA, Παλιγγενεσία, formed of παλιν, anew, and γενεσις, generation, a new birth, or regeneration.

PALINGENESIA is also used by some for the migration or passage of the soul of a deceased person into another body.

The palingenesia is almost the same thing with the metempsychosis taught by Pythagoras, and still believed by the Brachmans, Banjans, and other philosophers of the East.

PALINGENESIA is used among chemists for the reproducing a mixed body from its ashes.

This has been pretended to by many, as well as the philosopher's stone, and other wonderful powers; but as to the palingenesia, or resuscitation of plants, the instances produced are no more than some of those artificial vegetations which the learned Monf. Homberg has observed and described many times. See Homberg in Mem. Acad. Sciences, 1710; and Boyle's Works Abridg. vol. i. p. 69.

PALINGENIUS, MARCELLUS, in *Biography*, a modern Latin poet of considerable note, who flourished about the commencement of the 16th century, was probably a native of Stellata in the Ferrarese; whence he assumed the addition of Stellatus to his name. Some persons have imagined that he was physician to Hercules II. duke of Ferrara, to whom he inscribed his poem, entitled “Zodiacus Vitæ,” i. e. “De Hominis Vita, Studio, ac Moribus optime Instituentis,” lib. xii. It is denominated the Zodiac of Life, from its division into twelve parts, each inscribed with one of the signs of the zodiac. Its professed object is to guide men in the road to present and future happiness. From his invectives against the church of Rome, he is supposed to have been a convert to the reformation. The poem was placed

in the first class of prohibited books in the Index Expurgatorius; and it has been asserted, that his body was dug up, and burned; but very little seems to be known with certainty about the circumstances of his life. The poem has been highly applauded by some, and treated with a good deal of disrespect by others; but it has gone through a great number of editions, of which the best is said to be that of Rotterdam, 1722. It has been translated into the French language.

PALINGMAN, in our *Old Statutes*, seems to be a merchant-denizen, one born within the English pale. Stat. 22 Edw. IV. cap. 23. and 11 Hen. VII. cap. 22.

PALINGUIR, in *Geography*, one of the Philippine islands, about 15 miles in circumference, situated on the north of cape Engano, on the island of Luçon.

PALINIDRŪSIS, a word used by Hippocrates to express the subsiding of a tumour by the dispersion of the matter that occasioned it, without its breaking.

PALINODY, Πάλινωδία, a discourse contrary to a preceding one.

Hence the phrase *Palinodiam canere, to sing palinody*, q. d. to make a recantation.

The word in the original Greek signifies *singing again, or anew*. Hence it has passed as a general name for any poem, or the like, which contains a retraction in favour of a person whom the poet before had offended.

The poet Stesichorus is said to be the first author of the palinody. The sixth ode of the first book of Horace, beginning, "O matre pulchra," is a true palinody.

PALINTOCIA, Παλιντοκία, formed from *παλω, anew*, and *τοκος*, of *τεκεω, I bring forth*, in *Antiquity*, the birth of a child a second time.

Thus the second birth of Bacchus, proceeding out of Jupiter's thigh, was a palintocia.

PALINTOCIA is also used for the restitution of usury, or the refunding of interests.

The Megareans, having expelled their tyrant, ordained the palintocia; that is, they made a law, that all the creditors should return to their debtors the interests they had received for money lent.

PALINUM, CAPE, in *Geography*, a cape on the coast of Naples. N. lat. 40° 2'. E. long. 15° 10'.

PALIRRHŒA, a word used by the old Greek authors to express the reflux or retrograde course of the humours, as in case of the cholera morbus, where people vomit up their stools.

PALISADE, or PALISADO, in *Fortification*, an inclosure of stakes or piles driven into the ground, each six or seven inches square, and nine or ten feet long; three of which are hid underground. They are fixed about six inches asunder, and braced together by pieces nailed across them near the tops, and secured by thick posts at the distance of every four or five yards.

Palisades are placed in the covert-way, at three feet from, and parallel to the parapet or ridge of the glacis, to secure it from being surpris'd. They are also used to fortify the avenues of open forts, gorges, half-moons, the bottoms of ditches, the parapets of covert-ways; and, in general, all posts liable to surpris'e, and to which the access is easy.

Palisades are usually planted perpendicularly; though some make an angle inclining towards the ground next the enemy, that the ropes cast over them, to tear them up, may slip.

PALISADES, *Turning*, are an invention of M. Coehorn, in order to preserve the palisades of the parapet of the covert-way from the besieger's shot.

He orders them so, that as many of them as stand in the length of a rod, or in about ten feet, turn up and down like traps; so as not to be in sight of the enemy till they just bring on their attack; and yet are always ready to do the proper service of palisades.

PALISADE, in *Gardening*, denotes a sort of ornament; being a row of trees which bear branches and leaves from the bottom, cut and spread in manner of a wall, along the side of an alley, or the like; so as to appear like a wall covered with leaves.

These palisades are made of jessamine, phillyrea, &c.

PALISSE', in *Heraldry*, a range of palisades before a fortification represented on a fesse, rising up a considerable height: and pointed at top, with the field appearing through them.

PALISSY, BERNARD DE, in *Biography*, an ingenious artist and proficient in natural philosophy, was born at Agen, a city of France, situated on the Garonne, about the year 1524. He was brought up to the trade of a potter, which he carried on at Saintes, and he was also employed as a surveyor and draughtsman of plans. A thirst for instruction led him to travel, and having by accident got possession of a cup of enamelled pottery, his whole attention was turned upon endeavouring to imitate it. For this purpose he commenced a series of experiments that absolutely impoverished him; he even broke up his furniture to supply his furnaces with fuel, and sold his clothes to furnish his assistant operator with wages. At length his labours were crowned with success, and he so perfected himself in the manufacture, that he was immediately raised to the head of his profession. He now pursued the science of chemistry, and applied his knowledge to the improvement of agriculture. He was the first person who formed a collection of natural history at Paris, upon which he gave lectures at the rate of half a crown each person, a large sum for that period, but he entered into an obligation to return the money four-fold, provided it were found that he taught any thing that proved false. In 1563 he printed at Rochelle "Recepte veritable par laquelle tous les Hommes de la France pourront apprendre à augmenter leur Tresors, &c." which, after his death, was reprinted under the title of "Moyen de devenir riche," in two vols. 8vo. In 1580, he published "Discours admirable de la Nature des Eaux, et Fontaines, de Metaux, des Sols, des Saline, des Pierres, des Terres, &c." This work was exceedingly valuable in the then existing state of knowledge, and in it he first taught the true theory of springs, and asserted that fossil-shells were real sea-shells deposited by the waters of the ocean. He also pointed out the use of marle, and of lime in agriculture. This excellent philosopher was sincerely and ardently attached, with regard to religion, to the principles of Calvinism, on account of which he was, in the reign of Henry III. in 1584, apprehended and committed to the Bastille. The monarch, who, it appears, had a true regard for him, plainly said, that if he did not comply with the prevailing religion, he should be constrained to leave him in the hands of his enemies, to which Palissy replied, with energy, "Your Majesty has often said that you pity me; for my part I pity you for pronouncing the words *I shall be constrained*. This is not speaking like a king; but let me inform you in royal language, that neither the Guisarts, your whole people, nor yourself, shall constrain a potter to bend his knee before images." He used commonly to say, in allusion to his religion and his trade as a potter, "I have no other property than heaven and earth." Such are the only facts known of this estimable citizen; the time of his death is not ascertained.

A new

A new and complete edition of his works was published at Paris in 1777, with notes, by Faujas de Saint-Fonds. Gen. Biog.

PALIURI, CAPE, a cape on the coast of European Turkey, in the gulf of Saloniki. N. lat. $39^{\circ} 50'$. E. long. $23^{\circ} 46'$.

PALIURUS, in *Botany*, a name adopted from Dioscorides, but certainly misapplied here. He speaks of his *παλιυρος*, as a well-known prickly shrub, whose seed is fat, or oily, resembling that of flax, and good for coughs, calculous disorders, &c. Dr. Sibthorp judged that plant to be possibly the *Ziziphus vulgaris*; or *Rhamnus Ziziphus* of Linnæus. The description of the third species of *Rhamnus* in Dioscorides, so exactly accords with our *Paliurus*, that no doubt can exist of its being what he there described, and consequently not his *παλιυρος*. "The fruit," says he, "is broad, white, thin, shaped like a pouch or box, and resembling a socket or vertebra (*σφουδυλος*)." He had previously described the very long prickly shoots, and dark leaves. Tourn. t. 387. Juss. 380. Lamarck Illustr. t. 210. Gærtner. t. 43. Class and order, *Pentandria Trigynia*. Nat. Ord. *Dumofæ*, Linn. *Rhamni*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five equal, acute, spreading, deciduous segments, internally coloured; its base permanent. *Cor.* Petals five, minute, with narrow claws, inserted under the glandular disk of the flower, between the segments of the calyx. *Stam.* Filaments five, short, opposite to the petals; anthers small, roundish. *Pist.* Germen superior, roundish, bordered; styles three, very short; stigmas spreading, flat, obtuse, deciduous. *Peric.* Capsule coriaceous, of three cells, not bursting, globular, furrowed at the bottom with the permanent base of the calyx, and crowned at the top with a very broad, orbicular, membranous, striated, notched, horizontally spreading border. *Seeds* solitary, hard, ovate, compressed, rather polished.

Ess. Ch. Calyx tubular, five-cleft; its base permanent. Petals five, opposite to each stamen. Capsule coriaceous, of three cells, not bursting, crowned with a flat dilated border. Seeds solitary.

Obs. We are at length induced to separate this genus from *Rhamnus*, as well as *Ziziphus*, the fruit affording full as good a distinctive character in one case as in the other. (See *RHAMNUS* and *ZIZIPHUS*.) The seed-vessel of *Paliurus* is very peculiar. It has nothing that designates a berry, nor is it a dry drupa, because it consists of more than one cell, and the seeds can scarcely be termed nuts. Its texture and structure are most like what is observable in *Franxinus* and *Ulmus*. The cells, naturally three, are occasionally but two.

1. *P. australis*. Christ's Thorn. Gærtner. v. 1. 203. (*Paliurus*; Dod. Pempt. 756. Ger. em. 1336. Duham. Arb. v. 2. 96. (*Rhamnus Paliurus*; Linn. Sp. Pl. 281. Pallas. Ross. v. 2. 27. t. 64. Rh. tertius; Matth. Valgr. v. 1. 142. *Ziziphus Paliurus*; Willd. Sp. Pl. v. 1. 1103. Ait. Hort. Kew. ed. 2. v. 2. 18. Sm Fl. Græc. Sibth. v. 1. 159.)—Common in hedges and bushy places throughout the south of Europe, as well as in the Levant. Gerarde cultivated it in his garden, and it is sometimes preserved in old or curious collections, for the sake of singularity, or rather perhaps for the reputation attached to it of having been the thorn with which our Saviour was crowned. This its pliant and prickly nature seems to render probable. It is commonly delineated by Italian painters, and we verily believe that, if the sacred deposits of superstition were ransacked, this thorn would be found treasured up in them; at least in Italy. Yet Hasselquist sent Linnæus from the Holy Land a different shrub, which the latter named *Rham-*

nus Spina Christi. Its habit is much like our *Paliurus*, and the one is as likely to have been used for the execrable purpose on record, as the other. Nevertheless, we are most inclined to think neither of these was employed; but rather the prickly *Acanthus*, a common oriental plant, whose leaves would perhaps better serve the intention of mockery, as well as cruelty, than either, having some resemblance to the foliage of a victor's crown, and being most abundantly beset with fine sharp prickles.

The *Paliurus* flowers in June and July, and is perfectly hardy with us. When old, it forms a small upright tree, but in a wild state has long trailing branches, which are alternate, roundish, smooth and grey, somewhat zigzag; armed at the insertion of every leaf with two sharp prickles, one of them straight, the other curved. *Leaves* alternate, spreading, on short stalks, broad-ovate, an inch and a half long, bluntly pointed, crenate, smooth, three-ribbed, with many fine transverse veins. *Stipulas* small, pointed, permanent, changing to the above-described prickles, which are finally deciduous. *Flowers* several together, in little, short, tufted, axillary clusters, of a pale greenish-yellow. *Fruit* about an inch in diameter, pale brown or sometimes reddish, its texture rather spongy, except the middle, which is very hard. Pallas describes only one seed as perfected in Georgia, and about Mount Caucasus; other authors say two or three, as they, for the most part, described from specimens the produce of more favourable climes.

PALIZEUL, in *Geography*, a town of France, in the department of the Forests, and chief place of a canton, in the district of Neufchateau; 18 miles N.N.E. of Sedan. The place contains 800, and the canton 6203 inhabitants, on a territory of 300 kilometres, in 10 communes.

PALIZZI, a town of Naples, in Calabria Ultra; three miles E. of Reggio.

PALKANE, a town of Sweden, in the province of Tavastland; 23 miles N. of Tavasthus.

PALL, a circar of Hindoostan, in Guzerat, S. of Oudipour.

PALL, in *Heraldry*, denotes a kind of cross, representing the *pallium*, or archiepiscopal ornament, sent from Rome to the metropolitans; which is blazoned thus: he beareth gules, a cross pall, argent.

PALL, *Pallium Episcopale*, is a hood of white lamb's wool, to be worn as doctors' hoods upon the shoulders, with four crosses woven into it. And this pallium episcopale is the arms belonging to the see of Canterbury.

PALL. See **PALLIUM**.

PALLA, among the old Romans, a mantle which women wore over the gown called stola.

It was borne on the left shoulder, whence passing to the other side, under the right arm, the two ends were bound under the left arm, leaving the breast and arm quite bare. It made abundance of plaits or wrinkles: whence, according to Varro, it had its name: viz. from *παλλω*, *vibro*, I shake, or tremble.

Among the Gauls there was also a kind of palla worn by the men, called *Gallica palla*.

PALLA, in *Geography*, a small island in the East Indian sea; N. lat. $3^{\circ} 4'$. E. long. $125^{\circ} 28'$.

PALLADIA, in *Botany*, a name chosen, either by Lamarck or his continuator Savigny, for a genus of the southern hemisphere, which Gærtner had previously called *Blackwellia*; see **BLACKWELL**, **ELIZABETH**; but the latter appellation being given by Lamarck and Jussieu, as well as Willdenow, to a genus of the class *Dodecandria*, nearly related to **HOMALIUM**, see that article, it could not be retained for

for the plant before us. What *Palladia* means, is no where explained, nor can we form any conjecture worth offering. Lamarck Dict. v. 4. 698. Illustr. t. 285. (Blackwellia; Gært. t. 117.) Class and order, *Obandria Monogynia*. Nat. Ord. *Gentianæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, funnel-shaped, coloured; tube short; limb in four obovate segments. Cor. of one petal, funnel-shaped; tube long, with eight plaits; limb in eight oblong segments. Stam. Filaments eight, rigid, permanent, united to the tube of the corolla for more than half its length; anthers . . . Pist. Germens two, superior; style simple, compressed, situated between the germens and parallel to them, connected with their base, its edges finely toothed; stigmas two, spreading. Peric. Capsules two, club-shaped, prismatic, erect, parallel, close together, membranous, rigid, obscurely angular at one side, marked with a deep furrow at the other, each of one cell and two finally spiral valves. Seeds very numerous, minute, roundish, somewhat angular. Receptacle spongy, as long as the capsule, to the edges of whose valves, at the furrowed side, it is attached, being marked there by a similar furrow, while its other side is convex, and its whole surface rough with extremely minute tubercles.

Ess. Ch. Calyx in four segments. Corolla of one petal, in eight segments. Capsules two, superior, parallel, each of one cell, with two valves, and many seeds.

1. *P. antarctica*. The only species was given to Gærtner, as far as he could recollect, by Dr. J. Reinhold Forster, for a specimen of his own *Skinnera*, Forst. Gen. t. 29. From that it proved, on the slightest examination, totally distinct, for *Skinnera* is the very same genus with *Fuchsia*. But it may be questioned whether Forster, who studied the new plants of the Southern hemisphere, chiefly by the rules of the Linnæan artificial system, without regard to natural orders, might not, in the hurry of collecting, confound these two plants of the *Obandria Monogynia*, so as to lodge them together in his herbarium, and afterwards forget to distinguish them. Still no two plants can be more distinct, what little we know of the *Palladia* being too unlike every thing else, to leave a doubt in the mind of any botanist. Of its habit, herbage, or inflorescence nothing is recorded. The capsules are nearly two inches long. The figures above cited seem to represent the remains of the corolla, in four abrupt toothed segments only, which do not answer to the description of Gærtner, the only person who appears to have seen the plant. As Forster's specimens have been pretty generally distributed, it is much to be wished that some relics of this great botanical curiosity might be detected by one or other of their possessors.

PALLADIO, ANDREA, in *Biography*, a famous Italian architect, was born at Vicenza in 1518. He obtained instructions from the poet Trissino, who discovering in him a genius for sculpture and the arts connected with it, taught him the elements of the mathematics, and explained to him the works of Vitruvius. He soon obtained distinction as an architect, and having an opportunity of accompanying his patron to Rome, he employed all his faculties in examining the remains of ancient edifices in that capital, and formed his taste upon them. On his return, the conduct of many works of importance was committed to him, which he managed with great skill, and obtained for himself a high reputation. He was now sent for to Venice, where he built the palace Foscarini in the style of pure antiquity. Several other Italian cities were afterwards decorated with magnificent edifices, public and private, of his construction, and he was invited to the court of Emanuel Philibert, duke of Savoy, who received him with distinguished honours. To

Palladio is chiefly attributed the classic taste which reigns in so many of the buildings of Italy. His master-piece is reckoned the Olympic theatre at Vicenza, in imitation of that of Marcellus at Rome. He died in that city in 1580, having greatly improved his art, not only by his edifices, but by his writings, which are standard performances. Of these the following account is given; "His Treatise on Architecture, in four books, was first published at Venice in 1570, folio, and has several times been reprinted. A magnificent edition, in three volumes folio, was published at London in 1715, in Italian, French, and English. Another, equally splendid, has since been published at Venice, in four volumes folio, with the addition of his incited buildings. Lord Burlington published in London, in 1730, a volume, entitled "Idisegni delle Terme Antiche di Andrea Palladio." He composed a small work, entitled "Le Antichità di Roma," not printed till after his death. He illustrated Cæsar's "Commentaries," by annexing to Badelli's translation of that work, a preface on the military system of the Romans, with copper plates, designed, for the most part, by his two sons, Leonida and Orazio, who both died soon after." Palladio was modest in regard to his own merit, but he was the friend to all men of talents; his memory is highly honoured by the votaries of the fine arts; and the simplicity and purity of his taste have given him the appellation of the Raphael of architects.

PALLADIUM, in *Antiquity*, a statue of the goddess Pallas, three cubits high, holding a pike in the right hand, and a distaff and spindle in the left, preserved in Troy, in the temple of Minerva, on which the fate of that city is said to have depended.

The tradition is, that in building a citadel, in honour of Pallas, and a temple in the most elevated part of it, the palladium dropped from heaven, and marked out the place which the goddess was pleased to possess. After this Apollo gave an oracle, importing, that Troy should never be taken while the palladium was found within its walls: which occasioned Diomedes and Ulysses, in the time of the Trojan war, to undertake the stealing of it. For this purpose, having entered the citadel by night, or by means of secret intelligence, they stole away this valuable pledge of the security of the Trojans, and conveyed it into their camp; but they were scarcely arrived, when the goddess gave testimonies of her wrath. To which purpose Virgil makes Sinon say:

"Scarce to the camp the sacred image came,
When from her eyes she flash'd a living flame;
A briny sweat bedew'd her limbs around,
And thrice she sprung indignant from the ground;
Thrice was she seen with martial rage to wield
Her ponderous spear, and shake her blazing shield."

Pall's Æn. 2. 228.

It is said, there was, anciently, a statue of Pallas preserved at Rome, in the temple of Vesta; which some pretended to be the true palladium of Troy, brought into Italy by Æneas: it was kept among the sacred things of the temple, and only known to the priests and vestals. This statue was esteemed the destiny of Rome; and there were several others made perfectly like it, to secure it from being stolen. See ANCYLE.

There was also a palladium in the citadel of Athens, placed there by Nicias.

These palladiums, in all probability, were no other than a kind of talismans.

PALLADIUM, in *Chemistry*, a simple substance and a metal. This metallic substance was discovered by Dr. Wollaston in 1803, who gives the following process for preparing it.

It. The grains of platina, as they come from South America, are first to be roasted, to dissipate the mercury, and then digested in weak nitromuriatic acid, to separate the gold, and other metals of easy solubility. The remainder is now to be digested in a sand-bath, with strong nitromuriatic acid. The whole will be dissolved, with the exception of a black scaly powder, from which the metals *iridium* and *osmium* are obtained, and of which we have given an account under those articles. The solution contains platina, rhodium, and palladium, with perhaps other metals. The platina is first to be precipitated by a solution of muriat of ammonia. Into the remaining solution immerse a clean piece of zinc, which precipitates the palladium and rhodium in their metallic forms, with the other metals that may be present. This residuum is next to be digested, with weak nitric acid, in the cold, in order to dissolve any easily oxydable metal that may be present. The remainder, being washed with distilled water, is now to be dissolved in nitromuriatic acid. To this solution some muriat of soda is added, for the purpose of forming a triple salt with palladium, which is soluble in alcohol. The solution, with the common salt added, is now to be evaporated to dryness with moderate heat. This residuum is next to be washed with repeated additions of alcohol, till the liquor becomes colourless. The triple muriat of soda and palladium, and the same of platina, if that metal be present, are dissolved in the alcohol. The substance which the alcohol leaves undissolved is of a deep red colour, and contains the rhodium in the state of triple muriat of soda, and the latter metal. If the alcoholic solution still contains platina, it may be separated by muriat of ammonia. To the remaining solution now add prussiat of potash, which causes an orange precipitate. This, being washed and exposed to a tolerable heat, loses its water, and the acid assumes a grey metallic appearance. This substance is lastly to be heated with sulphur and borat in a crucible, when it will afford a metallic button which is pure palladium.

This metal is of a white colour, more of the appearance of platina than any other metal. It is something harder than the above metal, being about the stiffness of jewellers' gold. It is less malleable than silver or platina, owing probably to its greater hardness. Its specific gravity, according to Dr. Wollaston, varies from 11.3 to 11.8. When heated to about 30° of Wedgewood, it assumes a blue colour, owing to its combination with oxygen, in which property it has some resemblance to iron. If, however, the heat be increased, the oxygen flies off, and it re-assumes its original lustre. It does not fuse at the ordinary temperature of furnaces. Although its oxyd seems to be formed at a certain temperature in the open air, it has not been procured by these means. An orange oxyd is procured by precipitation from the acids, but not sufficiently pure to get the proportion of oxygen; hence we are at present unacquainted with the oxyds of palladium. It does not combine with carbon, nor is it known to combine with hydrogen, nitrogen, or phosphorus.

It combines with sulphur, forming a compound, fusible at a low red heat. The sulphur gradually escapes, leaving the metal in a state of purity.

According to the experiments of Chenevix, it forms an alloy with gold of a grey colour; less ductile than either of the metals. Its fracture was crystallized. Its specific gravity 11.079.

It forms an alloy with platina in equal parts. The alloy is as fusible as palladium. It is less malleable than that with gold. Its specific gravity was 15.141.

It forms an alloy with an equal part of silver, much harder than the latter metal, and whiter than platina. Its specific

gravity was 11.2. Its alloy with lead is very fusible, hard, and extremely brittle. Its specific gravity was 12. Equal parts of copper and this metal form an alloy of a yellow colour, harder than wrought iron. Its specific gravity was 10.392. Its alloys with tin, iron, bismuth, and arsenic, were tried by the same chemist, but had no striking characters.

The oxyd of palladium combines with the acids forming saline compounds, which have not been much attended to.

The sulphuric, nitric, and muriatic acids, when boiled upon palladium, oxydate and dissolve it; but the nitromuriatic acid acts upon it with the greatest energy. All the solutions are of a red colour. The oxyd is not precipitated from these solutions in a state of purity by the earths and alkalis, owing to its forming insoluble triple salts with most of those saline bases. The weight of the atom of palladium is not yet known with precision. Sir Humprey Davy has stated it to be about 17 times the weight of the atom of oxygen.

PALLADIUS, in *Biography*, an eastern prelate and ecclesiastical writer, was a native of Galatia, and born about the year 368. While a very young man he began to travel in foreign countries, and coming to Alexandria, in Egypt, he determined to embrace the monastic life. He spent three years under the discipline of Dorotheus, a celebrated ascetic of Thebes, and in 391 he visited the monasteries, and most celebrated solitaries in the desert of Nitria. At length, having wandered over almost the whole of Egypt, he was obliged, by the infirm state of his health, to quit that country, and retire to Palestine. In the year 400, or 401, he went into Bithynia, where he was ordained bishop of Helenopolis. It is by no means certain whether Palladius, author of the "Lausiac History;" and Palladius, author of a dialogue of the life of St. Chrysostom, written in 408, were different persons, or one and the same. Dupin reckons these works to have been written by the same hand; Tillemont and Fabricius think them the productions of different persons. The facts already cited are taken from the "Lausiac History," so called from Lausus, a man of eminence in the imperial court at Constantinople, to whom it is inscribed. Upon the supposition that it was the same Palladius, the author of the history, who wrote the "Dialogue," the following particulars may be added. He was ordained by St. John Chrysostom, to whose party he attached himself; and upon the banishment of Chrysostom, in 404, Palladius fell under persecution, and being obliged to withdraw from his see, retired into Italy, and took refuge at Rome. Some time after, venturing to return into the East, he was banished to Syene, at the southern extremity of Egypt. Having regained his liberty, he resigned the see of Helenopolis, and was appointed to the bishopric of Aspona in Galatia. It is not certain when he died, but it was probably some time before the year 431, since Eusebius, his successor at Aspona, presided at the council of Ephesus, which was held in that year. He wrote the "Lausiac History" about the year 421, which contains the lives of persons, who, at that time, were eminent for their extraordinary austerities in Egypt and Palestine. The style in which it is written is plain and simple; the first edition of it, in Greek, was published by Meursius at Leyden in 1616. In several manuscripts, there is subjoined to the "History" a book concerning the nations of India and the Brahmins, which has been attributed to Palladius, but without any proof of the fact. Cave says nothing can be affirmed of this work, only that it is the production of a Christian writer, who lived before the destruction of the Roman empire. Dupin. Moreri. Lardner, Cave.

PALLANDROS, in *Geography*, a town of the island

of Cyprus, situated at the foot of the mountain of St. Croix, anciently called "Palea;" 24 miles N. of Limasol.

PALLANTIA, in *Ancient Geography*, a town of Hither Spain, in the country of the Vaccæi; distinguished, according to Appian, by the valour of its inhabitants. See PALENCIA.

PALLANTIUM, a town of Arcadia, N.E. of Megalopolis, and at the extremity of a plain, which, being enfeebled by a colony detached to Megalopolis, became a village in the time of the emperor Antonine, who embellished it with some fine edifices, in honour of Pallas, Ceres, and Proserpine, freed it from every kind of imposition, and gave it entire liberty.

PALLAS, ♀, in *Astronomy*, a small planet, called asteroid by Dr. Herschel, discovered 28th March 1802, by Dr. Olbers, at Bremen, in Lower Saxony, and situated between Mars and Jupiter. It is so small that it does not subtend an angle large enough to be measured by our best instruments. Its orbit is very eccentric, and it is much inclined to the ecliptic; ascending above its plane at an angle of about 35°. The light reflected by it is of a less ruddy hue than that of Ceres, and it is attended by more or less of a nebulosity, proceeding, perhaps, from a copious atmosphere; and extending 468 miles from the body of the planet, whilst that of Ceres is 675 English miles high; and in this respect, as well as in the great inclination of its orbit, it appears to have some affinity to comets.

From Dr. Herschel's observations (Phil. Transf. for 1802. vol. 92.) we may conclude that the apparent diameter of Pallas is either 0."17 or 0."13: its mean distance from the sun 2.8; its distance from the earth, at the time of observation, 1.8333; and its apparent diameter, at the mean distance of the earth from the sun, subtends an angle of 0."3199, so that its real diameter, if the largest measure be taken, will be 147 miles; and if the smallest, resulting from a more distinct observation, be taken, the angle under which it would be seen from the sun will be only 0."2399, and its diameter no more than 110½ miles. (See ASTEROID.) The elements of the orbit of Pallas, as others have stated them, are as follow:

Tropical revolution	- - - - -	4 ^r 7 ^m 11 ^d
Sidereal revolution, from Maskelyne's Table	1703 ^d	16 ^h 48 ⁱ
Annual motion	- - - - -	2° 18' 11"
Mean longitude, Jan. 1, 1804	- - - - -	9° 29' 52" 58
Place of ascending node in 1802, from Maskelyne's Table	- - - - -	5 22 28 57
Place of ascending node in 1804, according to La Lande	- - - - -	5 22 28 0
Place of perihelion	- - - - -	4 1 7 0
Eccentricity, the mean distance being 1	- - - - -	0.24630
Inclination of orbit in 1801, according to Maskelyne's Table	- - - - -	34° 50' 40"
Ditto in 1804, according to La Lande	- - - - -	34 39 0
Greatest equation of centre	- - - - -	28 25 0
Mean distance from the Sun, that of the Earth being 1	- - - - -	2.7910
Mean distance in English miles	- - - - -	266,000,000
Diameter in English miles, according to Herschel	- - - - -	80
Ditto ditto, according to Schroeter	- - - - -	2099
Apparent mean diameter, as seen from the Earth	- - - - -	0."5

See PLANET and SOLAR System.

PALLAS is also a name given by some to the first satellite of Jupiter. Lowthorp's Abr. Phil. Transf. vol. i. p. 407.

PALLAS, in *Mythology*. See MINERVA.
VOL. XXVI.

PALLAS, Dr. PETER SIMON, in *Biography*, son of Simon Pallas, a native of Johannesburg, in Prussia, who was surgeon-major in the regiment of Dœnhof at Berlin, and was appointed, in 1741, professor of surgery at Berlin, and chief surgeon of the hospital in that city. Simon Pallas, the father, signalized himself by a treatise on chyrurgical operations, published in 1763, to which, in 1770, he added a supplement on the diseases of the bowels, and in that year he died, at the age of 76.

Peter Simon Pallas, the celebrated naturalist who forms the subject of this article, was born at Berlin on the 22d of September 1741. He received the early part of his education at home from private tutors, under whom the progress he made in his studies was truly amazing. Of those preceptors, Martin Schœling was one of whom his pupil ever after retained a grateful remembrance. To him he was indebted for a very early attachment to the science of entomology. Being destined to physic, so early as the 15th year of his age he entered upon a course of lectures on anatomy, physiology, botany, medicine, and surgery, under the professors Meckel, Sprœgel, Gleditsch, Rolof, and his father; and applied himself with great assiduity to anatomical dissections. He was so apt a scholar in these several branches of science, that in the beginning of 1758, we find him, according to the account he gave of himself to Mr. Coxe, enabled to read a course of public lectures on anatomy. Yet, although he was thus occupied in his professional labours, he still found leisure to prosecute the study of insects and other classes of zoology, for which he seems very early to have conceived a predilection, and in which he particularly and eminently excelled.

In the autumn of the same year, young Pallas repaired to the university of Halle; where he attended the lectures of the celebrated Segner on mathematics and physics, and improved his acquaintance with mineralogy in the environs of that city.

In the spring of 1759 he removed to Gottingen, and though prevented by a long and dangerous illness from prosecuting his studies with his usual ardour, yet he reaped great benefit from the instructions of the physicians Rœderer and Vœgel, and improved his general knowledge by diligently availing himself of the means of consulting the books in the public library.

During his residence at Gottingen, he made numerous experiments on poisons and the efficacy of other violent remedies, applied himself to the dissection of animals, and made repeated observations on the worms which breed in the intestines. On this subject he composed a very ingenious treatise, under the title of "De Infestis Viventibus intra Vienta;" in which tract he appears to have taken great pains to discriminate these noxious animals; and has with singular accuracy described particularly those worms which are found in the human body.

In July 1760 he was attracted to the university of Leyden by the fame of the celebrated physicians and naturalists Albinus, Gaubius, and Muschenbroeck; and by them he was noticed as a young man of a promising genius and indefatigable application. His talents particularly recommended him to the favour of Gaubius, principal professor and doctor of physic in that university.

In December he took his doctor's degree, and distinguished himself by an inaugural dissertation, in which he defended by new experiments the above-mentioned dissertation composed at Gottingen.

During his stay at Leyden, his taste for natural history became his predominant passion; he employed all the time he could steal from his professional studies in visiting the public and private cabinets of natural history, with which Leyden

abounded, and was particularly charmed with the collection of Gronovius, which he repeatedly examined.

Having visited the principal cities of Holland, he directed his course to London, where he arrived in July 1761. The principal intention of his journey to England was to improve his knowledge in medicine and surgery, and to inspect the hospitals. He was now, however, so much absorbed in his passion for natural history, that he neglected every other pursuit, and gave himself totally up to this favourite branch of science. At this juncture, his zeal was so ardent, that after having passed the day in curiously examining the various collections in natural history, and perusing the principal books he could procure on that subject, he would frequently employ the greater part of the night, and occasionally even whole nights together, whenever he met with new publications that either awakened his curiosity or interested his researches. With a view of extending his information in this department, he took several journeys to the sea-coasts, and particularly in Suffex.

Being at length summoned by his father to return to Berlin, he quitted London with regret in the latter end of April 1762, and repaired to Harwich in order to embark for Holland. Being there fortunately detained some days by contrary winds, he embraced that opportunity of examining the sea-coast, and collecting a variety of marine productions. On the 13th of May he landed in Holland, and passing through the Hague, Leyden, and Amsterdam, he continued his route through the circle of Westphalia, and arrived at Berlin on the 12th of June.

Previously to his commencing the practice of his profession, his father sent him to Hanover for the purpose of procuring the post of surgeon in the allied army; but as, upon his arrival in that city, in the month of July, peace was on the point of being concluded, he returned by Wolfenbuttle, Brunswick, and Helmsdtadt, to Berlin, there he passed a year, which he chiefly employed in preparing materials for a "Fauna Insectorum Marchica," or a description of the insects in the march of Brandenburg.

Animated by his predilection for natural history, and encouraged by the favour and patronage of Gaubius, he at length prevailed upon his father to let him go and settle in Holland. Thither accordingly he went, and resided at the Hague.

His reputation as a man of science was, by this time, so well established, that he was, the same year, elected fellow of the royal society of London; and in the following year member of the Academie des Curieux de la Nature; to both of which societies he had previously sent very interesting and ingenious papers.

The intimacy he now contracted with the most celebrated naturalists in Holland, and particularly with those of the Hague, who had just begun to form a literary society; the free access which he had to the museum of the prince of Orange, and other curious cabinets; the systematic catalogues of those collections that he drew up, and several of which he gave to the public; contributed to advance his knowledge of the productions of nature in the various parts of the globe, and to collect such materials as gave birth to those accurate compositions on zoology, which have deservedly distinguished him as the first zoologist of Europe. One of his earliest works in this branch of science, which rendered him eminently conspicuous, was his "Elenchus Zoophytorum."

The attention which Dr. Pallas had bestowed on the zoophytes, or animal plants, in the investigation of the worms which infest the human body, and particularly the uncommon nature of the *tania*, or tape-worm, as he acknowledges, seems to have led him into this line of natural science,

and in which he has shewn a great degree of accuracy, and surprising industry. In this work, after having treated on the nature of these ambiguous kinds of animals in a general method, and stated the various opinions of authors relating to the place they ought to hold in the system of nature, he describes from his own inspection more than 270 species of those worms and animalcules, known under the several general appellations of polypes, corals, madrepores, corallines, sea-pens, *tania* or tape-worms, sponges, sea-fans, &c.

The free access which he had to the museum of the prince of Orange, and other curious collections in Holland, enabled him to enrich his work with the description of a great variety of these productions, brought from both the Indies. He has described each species at large, and given it a new name, characteristic of its real discrepances; and, what especially increases the merit of his work, he has, with wonderful industry, extricated, as far as possible, the synonyms of former authors, both ancient and modern; thus rendering his book highly useful to such as are inquisitive in this branch of natural history.

In a dedication prefixed to his "Miscellanea Zoologica," published in the same year, the author lays before the prince of Orange a plan for a voyage to the Cape of Good Hope, and to the other Dutch settlements in the East Indies, and which, impelled by his wonted ardour for scientific knowledge, he offered to undertake and superintend. This project was strongly recommended by Gaubius, and approved by the prince; but was prevented from being carried into execution by the author's father; who not only refused his consent to his taking such a distant expedition, but even recalled him to Berlin: in obedience to his father's wishes, but with great reluctance, he quitted Holland in November 1766.

On his return to Berlin (continues Mr. Coxe, from whose ingenious travels these particulars are extracted), his only consolation in being separated from his friends in Holland, and in having lost so many opportunities of improving himself in natural history, consisted in putting into order the numerous materials he had collected, and the observations he was incessantly making, and in giving them to the public. He had, however, scarcely begun to publish his "Spicilegia Zoologica," before he was invited by the empress Catharine II. to accept of the professorship of natural history in the Imperial Academy of Sciences at St. Petersburg. Although in this instance his father and relations again refused their assent; yet the author's ardent zeal for his favourite science, joined to an irresistible desire to visit regions so little explored, induced him, without a moment's hesitation, to accede to the invitation, and to hasten his departure for a country, where his curiosity was so likely to be amply gratified. He accordingly quitted Berlin in June 1767, and arrived at Petersburg on the 10th of August.

He made his appearance among the Russians at a critical period. The empress had already ordered the Academy of Sciences to send astronomers into various parts of the Russian empire, to observe the transit of Venus over the sun's disk in 1769. Being just returned from a voyage down the Volga, and from visiting the interior provinces of European Russia, the enlightened sovereign had received the deficiencies of the topographical and geographical accounts, and anticipated the advantage of deputed learned and skilful men to visit the distant provinces of her extensive dominions; with a view to enlarge the bounds of science, and extend the knowledge of useful arts among the natives. For this purpose Catharine had directed the academy to send, in company with the astronomers, the most able naturalists and philosophers. Pallas instantly offered to accompany this expedition; and was as eagerly accepted. He was immediately charged

charged with drawing out general instructions for the naturalists, and was gratified with the choice of his associates. To him was submitted, at his own request, the conduct of the expedition to the east of the Volga, and towards the extreme parts of Siberia; and he was the most calculated for that expedition, as the elder Gmelin, who had been his precursor in those regions, had almost entirely neglected the zoology of those remote districts. Pallas employed the winter previous to his departure in forming a systematic catalogue of the animals in the cabinet of the Academy of Sciences; in putting into order the celebrated collection of professor Bryn of Dantzic, lately purchased by prince Orlof, in preparing for the press six numbers of his "*Spicilegia Zoologica*," which were printed during his absence, under the direction of Dr. Martin; and in forming the necessary arrangements and notices for his intended expedition.

At length, in June 1768, he quitted Petersburg, in company with Messrs. Falk, Lepekin, and Guldenstadt, as his associates; passed through Moscow, Vlodimir, Kafimof, Murom, Arsamias, to Casan; and having examined great part of that province, wintered at Simbirsk. From thence he departed, in March of the following year; and penetrated through Samara and Orenburg, as far as Gurief, a small Russian fortress, situated at the mouth of the river Yaik or Ural. There he examined the confines of Kalmuc Tartary, and the neighbouring shores of the Caspian, and returning through the province of Orenburg, passed the second winter at Ufa. After several expeditions in the adjacent parts of that province, he left Ufa on the 16th of May 1770; prosecuted his route through the Uralian mountains to Catharinenburgh; visited the mines of that district; proceeded to Tcheliabinsk, a small fortress in the government of Orenburg; and in December made an excursion as far as Tobolsk. The next year he was employed in traversing the Altai mountains, and in tracing the course of the Irtish up to Omak and Kolyvan; where, having inspected the celebrated silver mines, he made for Tomsk, and finished that year's expedition at Krasnoyarsk, a town upon the Yenisei. In that place, situated only in 56° north latitude, the cold was so intense, that the learned professor was witness to the natural freezing of quicksilver; which curious phenomenon he has minutely described. From Krasnoyarsk he issued on the 7th of March 1772; and proceeded by Irkutsk, and across the lake Baikal, to Udinsk, Selenginsk, and Kiakta, where the trade between Russia and China is principally carried on. Having penetrated into that part of Dauria which is situated in the south-easternmost part of Siberia, he journeyed between the rivers Ingoda and Argoon, at no great distance from the Amoor; thence tracing the lines which separate the Russian empire from the Mongul hordes dependent upon China, he returned to Selenginsk, and again wintered at Krasnoyarsk. In the summer of 1773 he visited Tara, Yaitk, and Astracan, and concluded his route for that year at Tzaritzin, a town upon the Volga; from whence he continued his journey in the ensuing spring; and arrived at Petersburg on the 30th of July 1774, after an absence of six years.

The account of this extensive and interesting tour was published by Dr. Pallas in five volumes 4to. which greatly extended his fame, and established his character. The author, in this valuable work, has entered into a geographical and topographical description of the provinces, towns, and villages, which he visited in his tour, accompanied with an accurate detail of their antiquities, history, productions and commerce. He has discriminated many of the tribes who wander over the various districts, and near the confines of Siberia; and specified with peculiar precision their customs, manners, and languages; he has also rendered his travels in-

valuable to the naturalist, by the many important discoveries in the animal, vegetable, and mineral kingdoms, with which he has enriched the science of natural history.

Two years afterwards, in 1776, the professor published his collections relative to the political, physical, and civil history of the Mongul tribes; in which he throws new light on the annals of a people, whose ancestors conquered Russia, China, Persia, and Hindoostan; and, at more than one period, established perhaps a larger empire than ever was possessed by any single nation. Mr. Pallas here proves unquestionably that the Mongul tribes are a distinct race from the Tartars; that they differ from them in their features, language, and government; and resemble them in nothing except in a similar propensity to a roving life. He intended a second volume describing their religious establishment, consisting in the worship of the Dalai Lama. It is the religion of Thibet and of the Mandshur sovereigns who now sit upon the throne of China. "A work," as Mr. Tooke, in his *Russia Illustrata*, Introd. p. cxi. justly observes, "that will enrich the stock of human knowledge with discoveries, the greatest part entirely new, and which no person but Mr. Pallas is able to communicate." Whether, however, this second volume ever made its appearance, we have our doubts.

In the same year in which Dr. Pallas printed his "*Elenchus Zoophytorum*," he also published a treatise under the title of "*Miscellanea Zoologica quibus novæ imprimis atque obscuræ animalium species describuntur, et observationibus iconibusque illustrantur*." This work is in a great measure incorporated into a subsequent publication made the next year on his return to Berlin, intitled "*Spicilegia Zoologica*," and was continued in numbers, or *fasciculi*, till 1780. The works of count Buffon, the illustrious French zoologist, amply attest the labours of Pallas, and our countryman Mr. Pennant makes frequent acknowledgments of his obligations to the same source, particularly for his history of quadrupeds and arctic zoology.

In June 1777, the learned professor read before the academy of Petersburg, in a meeting at which the king of Sweden was present, a dissertation on the formation of mountains, and the changes which this globe has undergone, more particularly as it appears in the Russian empire. This treatise appeared so curious to Mr. Tooke, who was also, as a member of the academy, present at that sitting, that he has given a translation of it in his "*Russia Illustrata*." In 1778 the doctor published "*Novæ species quadrupedum e Glirium ordine*," describing numbers of the rat genus and their anatomy. In 1781 he brought out "*Enumeratio plantarum quæ in horto Procopii à Demidof Moscuâ vigent*," or catalogue of the plants in M. Demidof's gardens at Moscow. His new northern collections on various subjects in geography, natural history, and agriculture, came forth the same year, to which were afterwards added two more volumes.

In 1782 he put forth two fasciculi or numbers of "*Icones infectarum præsertim Russiæ Siberiæque peculiarium*." In 1784 he published the first number of his "*Flora Russica*;" a splendid work, executed at the empress Catharine's expense. About this period her majesty conceived the idea of collecting from all quarters of the globe a universal vocabulary, the superintendance whereof she committed to our author, which necessarily for a time retarded his zoological researches. Exclusive of these separate publications, he printed in the acts of the imperial academy of sciences, various zoological and botanical dissertations.

Not long after this he was distinguished by a peculiar mark of imperial favour, in being appointed member of the board of mines, with an additional salary of 200*l. per annum*, and honoured with the order of St. Vlodimir. The empress also purchased

purchased his ample collection of natural history, in a manner highly flattering to the author, and honourable to herself. Being informed that professor Pallas was desirous to dispose of that collection, her majesty sent to let him know that her country should not be deprived of so exquisite a cabinet; that she would be the purchaser, and ordered him to make out the catalogue and fix the price. He accordingly named 15,000 rubles. Having examined the catalogue, she subjoined with her own hand: "Mr. Pallas understands natural history much better than figures: he ought to have charged 20,000 instead of 15,000 rubles for so many valuable articles. The empress, however, takes upon herself to correct the mistake; and hereby orders her treasurer to pay 20,000 rubles. At the same time Mr. Pallas shall not be deprived of his collection, which shall still continue to be in his own possession during his life, as he so well understands how to render it most useful to mankind."

In 1784 the care of putting in order and publishing the papers of Gmelin and professor Guldenstädt was assigned to Dr. Pallas, which he executed with great diligence and accuracy, though from some incidental cause to us unknown, only the first volume of Guldenstädt's remains, containing his journal and the description of the districts of mount Caucasus, ever came to the public eye.

In 1794 Dr. Pallas travelled to the Crimea, and on his return published an account of that delightful peninsula under the title of "Physical and Topographical Picture of Taurida." On his return, finding his health, by long and incessant labours, upon the decline, so as to render it necessary for him to remove to a warm climate, on preferring his request to the empress, he obtained not only immediate permission to chuse for himself a settlement in her dominions, but also on his pitching upon Taurida for that purpose, the grant of an estate in that province, and to the forming of his establishment a present of 10,000 rubles. Here it was that he was visited by Dr. Clarke on his travels in the year 1800; with whose account of his then situation we shall conclude these memoirs. "Akmetchet," says that spirited and ingenious traveller, "will long be celebrated as the residence of professor Pallas, so well known to the literary world. His fame would have been sufficiently established if he had published no other work than that begun by him under such favourable auspices, the "Flora Russica;" yet the barbarity of the people with whom he is compelled to live is such, that they will not allow him to complete the undertaking. The drawings were all finished, and almost all the text. To the hospitable and humane attentions of this excellent man we were indebted for comforts, equal, if not superior, to those of our own country, and for every literary communication it was in his power to supply. When we delivered our letters of recommendation to him, he received us rather as a parent, than a stranger to whose protection we had been assigned. We refused to intrude by occupying apartments in his house; this had more the appearance of a palace, than the residence of a private gentleman; but one day when we were absent upon an excursion, he caused all our things to be moved, and upon our return we found a suite of rooms prepared for our reception, with every convenience for study and repose. I consider myself indebted to him even for my life. The fatigue of travelling, added to the effect of bad air and unwholesome food, rendered a quartan fever so habitual to me, that had it not been for his care and skill, I should not have lived to make this grateful acknowledgment. He prescribed for me; administered every medicine with his own hands; carefully guarded my diet; and, after nursing me as his own son, at last restored me to health. When I recovered, he ransacked his museum for drawings, charts, maps, books, antiquities, minerals, and whatever

else might gratify our curiosity or promote the object of our travels; he accompanied us upon the most wearisome excursions, in search not only of the insects and plants of the country, but also of every document likely to illustrate either its ancient or its modern history. His decline of life has been embittered by a variety of unmerited afflictions; this he has borne even with stoical philosophy. Splendid as his residence appeared, the air of the place was so bad, that the most rigid abstinence from all sorts of animal food was insufficient to preserve his family from fevers. We left him determined to pass the remnant of his days in cultivating vineyards among the rocks upon the south coast of the peninsula. There was reason to hope, that by the death of Paul he would have been called to honours and emoluments; but subsequent travellers in Russia do not furnish intelligence so creditable to the administration of the new sovereign. When the late empress Catharine sent him to reside in the Crimea, with a grant of lands in the peninsula, it was intended for the re-establishment of his health, and as a reward for his long services; neither of these purposes has, however, been accomplished. A magnificent establishment in the midst of unwholesome air, has been all the recompence he has obtained. Thus it is that we find him, in the sixtieth year of a life devoted to science, opening his last publication with an allusion to "the inquietude and hardships which oppress him in his present residence, and embitter his declining days."—"We used," says Dr. Clarke, "every endeavour to prevail upon him to quit the country, and accompany us to England; but the advanced period of his life, added to the certainty of losing all his property in Russia, prevented his acquiescence. Our intreaties were to no effect; and perhaps before this meets the public eye, our friend and benefactor will be no more." Happily, however, Dr. Pallas survived the departure of our traveller upwards of ten years; when determining once more to see his brother and his native city, he took a journey to Berlin, where he died Sept. 8th, 1811, in the 71st year of his age. See Coxe's Travels; Tooke's View of the Russian Empire; and Dr. Clarke's Travels.

PALLASIA, in *Botany*, is destined to commemorate the very eminent scientific merits of the celebrated Peter Simon Pallas, knight of the Russian order of Wladimir, or Vlodimir, the chosen naturalist of the late empress Catharine of Russia. See PALLAS.

His *Flora Rossica*, his splendid monograph on the *Astragali*, as well as his botanical travels, and other writings, richly entitle him to such commemoration. His liberal communication of finely preserved specimens to Linnæus, assisted greatly to enrich the herbarium, as well as the later publications, of that distinguished man and his son; and the whole collection of dried plants, made by Pallas for his own use, having been purchased of him by Mr. Cripps, the companion of Dr. Clarke, now form a part of the valuable museum of A. B. Lambert, esq.

The original *Pallasia*, published by the younger Linnæus, in his *Supplementum*, p. 37, was what Pallas himself, in the 2d vol. of his travels, had named *Pterococcus*. He subsequently referred it to *Calligonum*, to which it unquestionably belongs; and L'Heritier, having adopted the same measure, chose a new *Pallasia*, in the *Encelia* of Adanson. (See *CALLIGONUM* and *ENCELIA*.) Nobody has given any explanation of the name last-mentioned, nor can we trace its meaning. Hence, probably, L'Heritier thought himself justified in superseding it, notwithstanding its claim to sufferance on account of sound, if not of sense. The latter was, upon principle, disregarded by its author in most of the names he preferred. L'Herit. in Ait. Hort. Kew. ed. 1. v. 3. 498. Mart. Mill. Dict. v. 3. Willd. Sp. Pl. v. 3. 2260. (Encelia; Adans. Fam. v. 2. 128. Juss. 186. Lamarek Dict.

Diét. v. 2. 356. Illustr. t. 709. Cavan. Ic. v. 1. 44. Ximenefia; Cavan. Ic. v. 2. 60. Willd. Sp. Pl. v. 3. 2116.) Class and order, *Syngenesia Polygamia-frustranca*. Nat. Ord. *Compositæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common Calyx* of numerous, oblong, imbricated, nearly equal scales. *Cor.* compound, radiated; florets of the disk numerous, tubular, five-cleft, all perfect; those of the radius ligulate, spreading, oblong, somewhat wedge-shaped, with three or four obtuse terminal teeth. *Stam.* in the florets of the disk only, filaments five, capillary, very short; anthers united into a cylindrical tube with five teeth. *Pistl.* in the florets of the disk, germen obovate, compressed, fringed; style thread-shaped, the length of the stamens; stigmas two, spreading; in those of the radius, germen obsolete or abortive, smooth; style and stigmas imperfect or wanting. *Peric.* none, except the permanent calyx. *Seeds* in the florets of the disk solitary, obovate, compressed, notched at the top, bordered and fringed at the margin; those of the radius obsolete and smooth. Down none. *Recept.* slightly convex, chaffy; its scales lanceolate, keeled, acute, nearly as long as the florets of the disk.

Ess. Ch. Receptacle chaffy. Down none. Seeds compressed, bordered and fringed. Calyx of numerous, imbricated, nearly equal scales.

Obf. We cannot scruple to reduce the *Ximenefia* of Cavanilles to our *Pallasia*, their habits being so similar, and the structure and appearance of the parts of the flower so much the same, as to overbalance the artificial distinction founded on the florets of the radius in *Ximenefia* being rather less imperfect; though by no means so perfect as to justify its being referred to the order *Polygamia-superflua*. This genus is sufficiently different from *Coreopsis*, with which Jacquin confounds it.

1. *P. halimifolia*. Downy Pallasia. L'Herit. Stirp. Nov. v. 2. t. 19, unpublished. Willd. n. 1. (*Encelia canescens*; Cavan. Ic. v. 1. 45. t. 61. *Coreopsis limesis*; Jacq. Ic. Rar. t. 594. Collect. v. 2. 299.)—Leaves blunt, nearly entire, downy on both sides. Radiant florets deeply and unequally four-toothed, scarcely twice as long as those of the disk. Native of Mexico. It is with us in Europe a stove plant, flowering from July to September, but not much cultivated. The stem is shrubby, branched and downy, about two feet high; branches alternate, leafy. Leaves alternate, on downy stalks about an inch long, broadly ovate, obtuse, one and a half or two inches long, entire, occasionally rather wavy or obscurely toothed here and there, three-ribbed, of a pale glaucous green, densely clothed on both sides with dense, soft, fine, short down. *Stipulas* none, but a dense snow-white tuft of accumulated down is more or less remarkable, at the insertion of each footstalk. *Panicles* terminal, corymbose, downy, rather leafy, of about four or five flowers, scarcely so large as a French Marigold (*Tagetes patula*), with a yellow radius whose florets are broad, short, unequally lobed, and a convex greenish disk.

2. *P. grandiflora*. Smooth Pallasia. Willd. n. 2. (*Encelia halimifolia*; Cavan. Ic. v. 3. t. 210.)—Leaves bluish, nearly entire, glaucous, smooth. Radiant florets slightly three-toothed, thrice as long as those of the disk.—Native of New Spain. It flowered at Madrid in September. *Cavanilles*. This has the habit of the foregoing, but the leaves are smooth, and the flowers larger, in consequence of the florets of the radius being much longer. Their colour is pale yellow; their apex obtuse, with only three very shallow teeth, instead of being deeply and irregularly lobed. The florets of the disk are of a reddish-white below, their limb dark brown. Such is the description in Cavanilles. We have seen no specimen, nor even heard of this species in England.

3. *P. ferratifolia*. Scerrated Pallasia. (*Ximenefia encelioides*; Cavan. Ic. v. 2. 60. t. 178. Willd. Sp. Pl. v. 3. 2116.)—Leaves pointed, ferrated, hoary beneath; with winged ferrated footstalks. Radiant florets three-toothed.—Native of Mexico, from whence the seeds were sent to the royal garden at Madrid. The plant flowered there in November. We have not heard of it in England, but are indebted to our late friend Cavanilles for a specimen. *Root* perennial. *Stem* three feet high, branched, leafy, downy, ribbed, pale, apparently somewhat shrubby, corymbose and many-flowered. *Leaves* mostly alternate, not opposite, except perhaps some of the lowermost, ovate, pointed, three-ribbed, with many lateral veins, strongly and sharply ferrated; their upper side bright green, besprinkled with small depressed bristles; under densely downy, pale, or glaucous. *Footstalks* about a quarter the length of the leaves, bordered with a narrow wing, which is greatly dilated and toothed at the base, where it clasps the stem or branch. *Flowers* terminating each branch, solitary, larger than the last, their radiant florets spreading, bright yellow, each near an inch long; disk brownish. Scales of the calyx lanceolate, acute, roughish, in several rows, hardly imbricated. Border of the seeds pale, ribbed, hairy; their disk beset with numerous, minute, sharp tubercles. Scales of the receptacle pale, finely fringed at the edges and keel.

Cavanilles named this supposed genus after Joseph Ximenes, an apothecary, who undertook a *Flora* of Castulo, in four volumes, in which he delineated more than 700 plants, besides native butterflies and birds of the same neighbourhood. Whatever his merits might be, the generic appellation given by Cavanilles could scarcely be retained, as the Linnæan system already contains a *Ximenesia*, long ago consecrated to one of his countrymen of the same name, by Plumier. See XIMENIA.

PALLAVICINO, FERRANTE, in *Biography*, a man of letters, was born at Placentia about the year 1615. He devoted himself to the church, and became a canon-regular of Augustines; but the turn which he had to satire, and which he could not restrain, was at length the cause of his ruin. During the contest between pope Urban VIII. of the Barberini family, and Edward Farnese, duke of Parma and Placentia, he supported the cause of his sovereign with his pen, and wrote some severe and galling satires against the pontiff, and all his house. The papal court set a price upon his head, which obliged him to withdraw to Venice, where he lived in obscurity. A young Frenchman, by affecting to pity his situation, obtained his confidence, and betrayed him to his enemies, who first imprisoned, and then beheaded him. The wretch who betrayed him was stabbed at Paris, some years afterwards, by a friend of Pallavicino. He was author of many works, which are distinguished by their severity and indecency. He also wrote a history of the public events in Italy in 1636. A selection of his works was published in two volumes 12mo. 1644, at Geneva, under the title of "Villa-franca." Moreri.

PALLAVICINO, SFORZA, a cardinal, born at Rome in 1607, was the eldest son of a marquis of that name, in Lombardy. He adopted the ecclesiastical profession in opposition to the inclination of his parents. He attained, at a very early age, to high preferment in the church, and he was admitted to the prelacy in the pontificate of Urban VIII. The prospects that opened before him did not, however, prevent his putting into execution a design of retiring from the world, and in his thirtieth year he commenced a novitiate in the society of Jesuits at Rome. When this was completed, he was employed several years in giving lectures in philosophy and theology, and in presiding over the studies of the Roman college. He composed a history of the council of Trent in
opposition

opposition to that of father Paul Sarpi, which labour was rewarded by pope Alexander VII. with a nomination to the cardinalate in 1657. After this elevation he continued to live in the cloister occupied in his studies, and in the concerns of the church, and affording an example of Christian virtue and piety till his death in 1667.

The cardinal was author of other works besides the "History of the Council of Trent;" these were partly ascetical, partly moral, and partly theological. He also published a tragedy, entitled "Ermenigildo," which he afterwards republished with a preliminary discourse, said to be more valuable than the tragedy itself. To this ecclesiastic also belongs a grammatical work, entitled "Avvertimenti Grammaticale," published under the name of Fr. Raimondo. His "Letters," in Italian, were published two years after his death. The "History of the Council of Trent" was also written in Italian, and was at first printed at Rome in two volumes folio, 1656, 1657. It was, in 1664, republished in three volumes, 4to. with various corrections and additions by the author. A translation of it in the Latin language was published at Antwerp, in 1672, by father Giattini. Moreri.

PALLEIROS, in *Geography*, a mountain of Arabia, in the province of Oman; 80 miles W.S.W. of Mascat.

PALLENE', in *Ancient Geography*, one of the three peninsulas, which formed at its extremity a more considerable peninsula, between the Thermaic gulf and the Strymon. This peninsula lay to the S.W., and according to Steph. Byz. upon it was also a mountain under the same appellation, of a triangular form, and had upon it, says Scylax, five towns; one of which was called by the same name. It belonged to Macedonia.

PALLET, among *Painters*, a little oval table, or piece of wood, or ivory, very thin and smooth; on and round which the painters place the several colours they have occasion for, to be ready for the pencil.

The middle serves to mix the colours on, and to make the tints required in the work. It has no handle, but, in lieu thereof, a hole at one end, to put the thumb through to hold it.

PALLET, among *Potters*, *Crucible-makers*, &c. is a wooden instrument, almost the only one they use, for forming, beating, and rounding their works.

They have several kinds; the largest are oval, with a handle; others are round or hollowed triangularly; others, in fine, are in manner of large knives, serving to cut off what is superfluous on the moulds of their work.

PALLET, in *Gilding*, is an instrument made of a squirrel's tail; used to take up the gold leaves from the pillow, to apply and extend them on the matter to be gilt. See GILDING.

PALLET, in *Hera'dry*, is the moiety or half of the pale; or a small pale, half the breadth of the usual one.

The pallet must never be charged with any thing either quick or dead; neither can it be divided into two equal parts; but it may be into four; for one-fourth part of the pallet, or two-eighth parts of the pale, is called an endorse.

If the pale be upon any beast, they say, the beast is *debruised* with the pale; but if the beast be upon the pale, they say he is *supported* by it.

PALLETS, in *Clock and Watch-work*, are those pieces or levers, which are connected with the pendulum or balance, and receive the immediate impulse of the swing-wheel, or balance-wheel, so as to maintain the vibrations of the pendulum in clocks, and of the balance in watches. The pallets in all the ordinary constructions of clocks and watches, are formed on the verge or axis of the pendulum or balance, and

are of various lengths and shapes, according to the construction of the piece, or the fancy of the artist. For the modern improvements, comparative advantages, and the manner of constructing pallets, see ESCAPEMENT.

PALLET, in *Ship Building*, is a room within the hold, closely parted from it, in which, by laying some pigs of lead, &c. a ship may be sufficiently ballasted, without losing room in the hold; which, therefore, will serve for stowing more goods.

PALLETING, a slight platform made over the bottom of the magazine, to preserve the powder from damp.

PALLI, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir; 85 miles N.E. of Diarbekir.

PALLIANO, or PALLIANO, a town of Campagna di Roma; 28 miles E. of Rome.

PALLIATION, in *Medicine*, signifies the act of alleviating the more violent symptoms of a disease, by those means which have no power of removing the disease radically. Whence also the terms

PALLIATIVE MEDICINES, palliative indications, palliative treatment, &c. are applied to those remedies which the physician adopts, and to the rules of practice to which he is directed by the symptoms, under such circumstances.

The palliative treatment is never resorted to by a skilful practitioner, except under one of two conditions of his patient; namely, when the disease, under which he labours, is clearly of an incurable nature, or advanced to an incurable stage; or, on the other hand, when some of the symptoms of a disease, which is in itself curable, are so violent as to become themselves the source of extreme distress, or even of danger, to the patient. Both these conditions are of frequent occurrence. Every organic disease, in its advanced stage, affords an example of the first, especially when it is accompanied by severe pain: for in that case, it becomes necessary to diminish the sufferings of the patient, by a constant use of narcotic medicines, although these will not contribute, in the smallest degree, to arrest the progress of the disease. Of the second condition just mentioned, many examples might be adduced: but it may be sufficient to observe, that, in *fevers*, many symptoms occasionally occur, which materially aggravate the original disease, if not palliated; and the palliation, therefore, becomes an object of the first importance, although the means to be adopted for that purpose do not strike at the root of the fever. Thus an intense heat of the surface will, by the painful irritation which it produces, occasion extreme restlessness, thirst, loss of sleep, and increased quickness of pulse; whereas if the heat be palliated by external coolness, and by cold drinks, all these secondary circumstances will be removed, and the ultimate chance of recovery greatly increased. In like manner, a severe diarrhoea, great constipation, or a violent local pain, often require palliation, by means which have no direct influence upon the primary fever. There are but too many practitioners, however, who from an imperfect knowledge of the principles of physiology and pathology, cannot see beyond the most prominent symptoms of a disease, and whose whole practice is comprised in a succession of palliative measures: such men are often called *experienced*, because they have seen much disease, but being destitute of first principles, they never acquire a true experience.

PALLICODE, in *Geography*, a town of Hindoostan, in Mytore, at the extremity of a pass leading to the Barmaul country, called either the "Pass of Pallicode," or the "Pass of Oodeadurgum." Through this pass the Mytore armies were generally sent to invade the Carnatic; 11 miles N.W. of Dorempoury.

PALLIER, or PALLIER, in *Building*, a landing-place

in a staircase : or a step, which, being broader than the rest, serves to rest upon. See STAIRCASE.

The term is pure French, and is not much used in English. In perrons, on large staircases, where there are sometimes several palliers in the same range, or line, they ought to have each at least the width of two steps. Those in the turns of staircases ought to be as broad as long. Vitruvius calls the palliers on landing-places of the theatres, *diazomata*.

PALLIFICATION, or **PILING**, in *Architecture*, denotes the piling of the ground-work, or strengthening it with piles, or timber driven into the ground; which is practised when people build upon a moist or marshy soil.

PALLIGORAM, in *Geography*, a town of Hindoostan, in Golconda; 25 miles S.E. of Hydrabad.

PALLIJOW, a town of Hindoostan, in Bahar; 45 miles S.W. of Patna.

PALLIO COOPERIRE. It was an ancient custom, where children were born out of lawful wedlock, and their parents afterwards intermarried, that those children, together with the father and mother, should stand *pallio cooperti*, under a cloth spread over them, while the marriage was solemnizing; which was a kind of adoption, and had the effect of a legitimation.

Thus Robert Grosthead, the famous bishop of Lincoln, in one of his letters, says; "In signum legitimationis, nati ante matrimonium consueverunt poni sub pallio super parentes eorum extento, in matrimonii solemnizatione."

Selden, in his notes on Fleta, adds, that the children of John of Gaunt, duke of Lancaster, by Catharine Swinford, though legitimated by act of parliament, yet were covered with the pall at the time of the marriage of their parents.

PALLIOT, PETER, in *Biography*, was born at Paris in 1608. He settled at Dijon, where he married the daughter of a painter, and followed the same profession. From an early age he had attached himself to the studies of genealogy and heraldry, which he contrived to pursue with great assiduity, publishing several works upon those subjects. He died at a very advanced age in the year 1698. His principal works are, "Le Parlement de Bourgogne," 1649: to which another volume was added by Fr. Petitot in 1733. "Science des Armoiries de Gelliot, augmentée de plus de 6000 Ecuiffons." Besides these he published genealogical histories of particular families, and he left in MS. thirteen volumes folio, of memoirs concerning the families of Burgundy. He not only printed his own works, but engraved with his own hand all the very numerous heraldic plates by which they were illustrated. Moreri.

PALLISADES. See PALISADE.

PALLISADOED CROWN. See CROWN.

PALLISER, CAPE, in *Geography*, a cape on the E. coast of New Britain. S. lat. $4^{\circ} 22'$. E. long. $191^{\circ} 25'$.

PALLISER, CAPE, a cape on the S. coast of Eabeinomaue, the northern island of New Zealand, and N.E. point of Cook's Strait. S. lat. $41^{\circ} 38'$. E. long. $175^{\circ} 23' 12''$.

PALLISER'S ISLANDS, a cluster of islands in the South Pacific ocean; the largest being about fifteen miles long and nine broad, connected together by a reef of coral rocks, and difficult of access. S. lat. 15° to 16° . W. long. 146° to 147° .

PALLIUM, or **PALL**, a pontifical ornament worn by popes, patriarchs, primates, and metropolitans of the Romish church, over their other garments, as a sign of their jurisdiction.

It is in form of a band, or fillet, three fingers broad, and encompasses the shoulder; whence, by some authors, it is called *superhumeralis*. It has pendants, or strings, about a palm long, both before and behind; with little laminæ of

lead rounded at the extremes, and covered with black silk, with four red crosses.

Some, with Eusebius, will have the pallium to have been introduced by pope Linus; adding that as the ephod was the mark of the pontifical authority in the Jewish Synagogue, so is the pallium in the Romish church.

Others have observed, that there is no mention made of it before the year 336.

Lastly, others will have it to have been first granted by Constantine the Great, to pope Sylvester; from whence it passed to the other patriarchs and archbishops.

The pall, it is certain, was originally part of the imperial habit, being a rich robe of state, very magnificent, and reaching quite to the ground; and it has been said, that the bishops of Rome were allowed to wear it by Constantine the Great, and that in process of time the same honour was granted by the emperors to the other patriarchs. Hence, when they were either driven from their sees, or voluntarily quitted them, they returned their palls to the emperors. When the popes first took upon them to grant that honorary badge, which they did before the pontificate of Gregory the Great, chosen in 590, they did not presume to do it till they had obtained leave of the emperor. But the successors of Gregory, upon the decline of the empire, took upon them to bestow that mark of distinction independently of them, and as a gift of their own. However, that it might no longer be deemed part of the imperial habit, which it was treasonable to wear without leave from the emperors, they changed its ancient form to the present. At what time the popes assumed the disposing of the pall, independently of the emperors, is not well known; but it is certain, that no bishop was obliged to apply to Rome for it till the year 742, when Boniface, bishop of Mentz, persuaded the bishops of France and Germany to pass a decree, obliging their metropolitans to apply to the pope for that ornament, and to promise, upon their receiving it, a canonical obedience to the commands of St. Peter. This practice proving very favourable to the ambitious designs of the bishops of Rome, they spared no pains to impose it upon all metropolitans; issuing, with this view, various decrees concerning the nature, virtue, and necessity of the pall; till, at length, they proceeded to declare it unlawful for a metropolitan, archbishop, or primate, to exercise any branch of his power, till he had received his pall from Rome; nay, in several decrees, the metropolitanical jurisdiction and power were said to be conferred by the pall; and thus they made the pope the fountain of all ecclesiastical power and authority. This doctrine seems to have been first broached in the ninth century, though vigorously opposed by Hincmar, archbishop of Rheims, and several others. However, the doctrine prevailed; and the pall was declared by Innocent III. in the thirteenth century, to be an ensign or token of the plenitude of the apostolic power, and said to communicate a competent share of that power to those who received it from the hands of the popes. Till the time of Gregory VII. the new metropolitans were only required to send for their palls within the space of three months after their ordination; but this pope obliged all, unless prevented by some lawful impediment, to come for them in person to Rome; and the promise of canonical obedience, upon receiving their palls, was changed into an oath of allegiance, such as vassals by the feudal laws were obliged to take to their princes. Gregory the Great conferred the pall without fee or reward; and in a council held at Rome in 595, decreed, that it should be given gratis; but it is well known, that in succeeding times the grant of the pall became one of the chief funds of the popish see. Exorbitant sums were exacted not only for the palls that were sent to presbyters, or private bishops, when raised to the archiepiscopal dignity, but likewise for those that were sent

to archbishops on their translation from one see to another. For by the canons, an archbishop is not to carry away his pall with him, but to demand a new one; and his successor is not to make use of the pall, which his predecessor had left, but to apply to Rome for another. Bower's Hist. of the Popes, vol. iii. p. 6. note (c).

The pope pretends to the sole right of conferring the pallium; though some patriarchs have granted it to their suffragans, having first received it themselves from the Roman see.

Anciently, the pope used to send the pallium to certain of his diocesan bishops, on whom he laid a good part of his authority, and who were a kind of collaterals to him, as the patricii were to the emperors.

The first who received it in France was Vigilius, archbishop of Arles: this was done, in order, as Pasquier observes, to give him the precedence over the other bishops.

Anciently they went to Rome to seek the pallium in person; afterwards it was sent by the pope's legates. At last the custom was introduced of sending persons express to demand it, with this form, *Instante, Instantius, Instantissime*.

By the popish canon laws, a metropolitan, till he have received the pallium, cannot consecrate bishops, or churches, and he may not be called archbishop, &c. Upon a translation, he must have the pallium afresh; and till then he cannot hold a synod, nor perform any of his archiepiscopal functions.

The pallium was anciently interred with the person.

The use of the pallium is restrained to certain seasons and occasions; none but the pope having a right of wearing it always, and in all places.

The pope sometimes sends it to bishops of his own accord; and has sometimes given the right hereof to particular churches.

Among the Greeks all the bishops wear the pallium.

In ancient records, we find mention made of another pallium, which was a long garment spread over with crosses, Tertullian says it was a distinguishing garment of the Christians; that of the heathens being called *toga*.

PALLIUM *Episcopale*. See PALL.

PALLIUM *Ducale*, in *Natural History*, a name given by writers on shells to a kind of pecten, or scallop, of a large size and beautiful appearance, though simple colour. There are two species of this, a red and a yellow one.

PALLIUM-*purpureum*, a name given by Basil Valentine, and other of the affected writers in chemistry, to a powder of a purple colour, prepared from gold. It is made by preparing an amalgam of gold and mercury; and after the mercury is driven off by the retort, the remaining matter is mixed with sulphur, and calcined by a well regulated fire till reduced to a purple powder. This is called also the *solar powder*, and has, like the other preparations of this metal, many imaginary virtues ascribed to it.

PALLS, in *Ship Building*, strong short pieces of iron or wood, so placed near the capstan or windlafs as to prevent its recoil or giving way, which may very much endanger the men at the bars, in the act of heaving up the anchor, or otherwise, when charged with any great effort.

PALLUAU, in *Geography*, a town of France, in the department of the Vendée, and chief place of a canton, in the district of Les Sables-d'Olonne; 16 miles E.S.E. of Challans. The place contains 328, and the canton 8794 inhabitants, on a territory of 230 kilometres, in 10 communes.

PALM, PALMUS, an ancient long measure, taken from the extent of the hand.

The Roman palmus was of two kinds: the *great palm*, taken from the length of the hand, answered to our span, and contained 12 fingers, digits, or fingers' breadths, or 9 Roman inches, equal to about 8½ English inches. See DIGIT, and SPAN.

The *small palm*, taken from the breadth of the hand, contained 4 digits or fingers, equal to about 2 English inches, 9 tenths.

The Greek palm or *doron* was of two kinds. The small contained 4 fingers, equal to little more than 3 inches. The great contained 5 fingers. The double Greek palm, called *dichas*, contained also in proportion. See MEASURE.

The modern palm is different in different places where it obtains. At Rome, the canna for woollens and silken stuffs = 78½ English inches = 8 palms; but the builders' canna = 87½ English inches = 10 palms; at Naples, the palm, is the 8th part of the canna = 10½ English inches; at Genoa, the palm is 9½ inches; at Oporto, it is 8 inches: the English palm is 3 inches.

At Leghorn there are two kinds of palms, the one for woollens, the other for silks; the first one-third shorter than the latter. See the Tables under MEASURE.

PALM, *Palma*, in *Anatomy*, denotes the inside of the hand; called also *vola* and *metacarpion*.

PALM, in *Naval Language*, is an implement used instead of a thimble, in making and mending sails. It is formed of a piece of leather, seal's skin, or canvas, on the middle of which is fixed a round plate of iron, of an inch in diameter, whose surface is pierced with a number of small holes, to catch the head of the sail-needle. The leather is formed so as to encircle the hand, and button on the back of it, while the iron remains in the palm; so that the whole strength of the hand may be exerted to thrust the needle through the canvas, when it is stiff, and difficult to be penetrated. Falconer.

PALM, *Dwarf*, or PALMETTO, in *Botany*. See CHAMÆROPS.

PALM-Oil. See OIL.

PALM-Tree. See PALMÆ.

PALM-Wine, called in the East *toddi*, is obtained by incision of the trunk of a species of palm-tree, whence issues a liquor very grateful to the palate, but liable, especially on account of the heat of the climate, soon to turn sour.

PALM Islands, in *Geography*, a chain of islands near the N.E. coast of New Holland; extending about 30 miles in length, at the entrance of Halifax bay. S. lat. 18° 53'. W. long 213° 25'.

PALMA, FILIPPO, in *Biography*, a Neapolitan finging-master, totally without voice that could be called tuneful, yet he sung, or seemed to sing, with such exquisite taste, as to revive the miraculous powers of music equal to those ascribed to Orpheus, Amphion, and Linus. Besides his want of voice, he was so ignorant of counterpoint, that he could not make a base to the most simple melody. And though the airs which he composed for his own singing were universally applauded, he was so humble as to condescend to ask a young apprentice to Dr. Arne to furnish a base; and yet he touched the harpsichord in so original and seemingly masterly a manner, that this apprentice would have given the world to exchange all his knowledge in counterpoint for signior Palma's "Toccatini." Gluck's celebrated air in Artamene, "Rasserena il mesto ciglio," admirably sung by Monticelli at the opera, and encored every night, when sung by Palma without voice in private, the fine voice, figure, action, and knowledge of Monticelli were annihilated and forgotten. A singer in a room may hazard embellishments, which, on a stage, accompanied by a powerful orchestra, would have no effect. Palma's manner of singing and vary-

ing "The Lads of Paties Mill," had more effect, even upon the most enthusiastic admirers of grand airs, than the performance of the greatest singers.

The author of "Traité sur la Melodrame," (le chevalier de Chastellux) relates an anecdote of Palma, which is perhaps as strong an instance of the power of song in a modern, as can be found in the legends of ancient music. Palma was always in "love and in debt, though (being an Italian) seldom in drink." Having been caught at home by surprise by one of his deepest and most enraged creditors, from whom he had been long skulking, in order to escape his gripe; and on the inexorable creditor informing him of his business, and of the care that would be taken of his person by the gentleman whom he had brought with him; Palma made no other reply to his abuse and his threats, than by sitting down to the harpsichord and singing two or three of his most pleasing and touching airs to his own accompaniment: when the fury of the creditor was so softened by degrees, that at length he was entirely appeased, and not only forgave him his debt, but lent him ten guineas to stop the mouth of other creditors, who threatened him with a gaol.

But this security was of short duration, for he was soon after thrown into the king's bench, where we visited him, and found him writing to his brother, then a prisoner likewise in York gaol; when finding that the male Siren was putting his letter into a cover, we informed him of the expence in which it would involve his brother, by a double letter, when he said—"Che fare? é capo di casa, ci vaol rispetto. What can I do? He is my elder brother, and head of our house, we must shew him respect."

PALMA, GIACÓPO, was born at Serinalto, in the territory of Bergamo, and was a disciple of Titian. He had genius and judgment, and his manner much resembled that of his master. His colouring had extraordinary strength and brightness, and his pictures are wrought to great perfection, though the execution of them is free and not over laboured.

Vafari describes, with great fervour, a composition of the elder Palma, at Venice; representing the ship in which the body of St. Mark was brought from Alexandria to Venice. "In that grand design," he says, "the vessel was struggling against the fury of an impetuous tempest, and is expressed with the utmost judgment: the distress of the mariners, the violent curling of the waves against the sides of the ship, the horrid gloom only enlivened with flashes of lightning, and every part of the scene filled with images of terror, are so strong, so lively, and naturally represented, that it seems impossible for the power of colour or pencil to rise to a higher pitch of truth and perfection; and that performance very deservedly gained him the highest applause."

Notwithstanding this deserved praise, his pictures in general are not correct in design, and his latter works did not maintain his early reputation. He died, according to Vafari, at the age of 48; but in what year is not absolutely known.

PALMA, in *Geography*, one of the Canary islands, about 60 miles in circumference, anciently called "Capraria," said by some to have derived this name from a volcano so called; though others ascribe it to the great number of goats that are fed here. The soil is fertile in corn, wine, and sugarcanes, as well as in fruits, quadrupeds, and birds of all kinds. This island has a handsome town and a safe harbour, much frequented for its wines, which are reckoned equal to Malmsey, and thought by some to be the best of any produced in the Canaries. (See CANARY *Islands*.) N. lat. 28° 36'. W. long. 18°.

PALMA, the capital of Grand Canary. (See CANARY.)—
VOL. XXVI.

Alfo, a town of South America, in the province of New Granada; 36 miles N.W. of Santa Fé de Bogota.—Alfo, a town of Naples, in the province of Lavora; 14 miles E. of Capua.—Alfo, a town of Naples, in the province of Calabria Ultra, near the sea, which was a great mart for oil; destroyed by an earthquake; 11 miles W.N.W. of Oppido.—Alfo, a town of Sicily, in the valley of Mazara, in the vicinity of which is a rich sulphur mine; and on a lake near the sea, not far from it, are white partridges; 6 miles S. of Naro.—Alfo, a town of Spain, in the province of Cordova, on the Guadalquivir; 27 miles S.W. of Cordova.—Alfo, a town of Portugal, in Estramadura, on the right side of the river Cadaon; 18 miles E. of Setuval.—Alfo, a river of Brasil, which runs into the Tocantin, S. lat. 14° 16'.—Alfo, the capital of the isle of Majorca, the see of a bishop, and the residence of the captain-general of the Balearic and Pityuse isles. The city is situated on the banks of a large bay formed by the sea, between the capes Blanco and Cala Figuera, which is said to be 3½ leagues wide; the port, though small, is good and safe. The city is built on a declivity on the sea-shore, in the part where the port makes a bend. It is surrounded with walls, flanked by twelve bastions; here are a half-moon, horn-work, and several redoubts; on the land side there is a dry ditch; but all these fortifications could not sustain a well-conducted siege. It has eight gates, three of which are on the side of the sea. The streets in some parts of the city are narrow, and badly paved; those in the lower parts, as well as of the squares, are large and regular. The population of the city is reckoned at 33,000 inhabitants. The bishopric is a suffragan of Valencia; the diocese comprehends 40 parishes, and the revenue amounts to 45,000 piastras a-year. The chapter consists of six dignitaries, whose stipend amounts to 10,000 piastras among them, and the prebends are estimated all together at 42,500 piastras. Here are five rich parish churches, twelve monasteries, eleven convents, besides one in the suburbs, a number of chapels or oratories, four hospitals, two religious houses, nine penitentiaries, two colleges, and several remarkable public edifices. The administration is composed of a captain-general and royal audience, who have the entire government of the kingdom, and decide as a supreme court on civil, criminal, and military affairs. The cathedral church, which stands in the highest part of Palma, is handsome and large, of Gothic architecture, with three aisles and lofty vaulted roofs. The parish of St. Michael is one of the most ancient; it was a mosque in the time of the Moors. The other churches have been built since, and are all large, and ornamented with turrets or spires of different forms. The episcopal palace is large, adjoins the cathedral, and is built of beautiful stone. The palace royal of government, where the captain-general and intendant-general reside, is the most considerable, and commands the sea-shore. The house of Contractation, built in the 14th century, is of Gothic architecture, and is the place where the merchants assemble, and where the public fetes and masked balls are held; near it is the consulate, where the board of commerce holds its sittings, and which gives its audience gratuitously. The mansion-house has a quantity of sculpture on its entablature, and a number of Gothic ornaments. The clock of this building marks and strikes the different hours of the day and night, according to the progress of the sun, and the different solstices, and is generally allowed to be the only one of the kind in the world. The houses in the town of Palma are pleasant; some are even built of marble.

PALMA *la Nuova*, a town of Italy, in the country of Friuli, on the borders of Goritz, situated on a canal, which
O commu-

communicates with the Lizonzo. It is fortified and surrounded with nine bastions, which bear the names of nine Venetian noblemen; 55 miles N.E. of Venice. N. lat. 46° 2'. E. long. 13° 16'.

PALMA *di Solo*, a sea-port town of the island of Sardinia, on the S. coast. N. lat. 30° 20'. E. long. 6° 24'.

PALMA, *Cape*, a cape on the coast of Ancona. N. lat. 43° 3'. E. long. 13° 50'. — Also, a cape on the W. coast of Africa, in the country of Angoy. S. lat. 5° 50'.

PALMA *Christi*, in *Botany*, &c. See RICINUS and CASTOR *Oil*.

PALMÆ, the Palm tribe, a most distinct and important, as well as lately and beautiful, natural order of plants, so named from *Palma*, the ancient appellation of the most valuable among them, the Date tree; whose foliage was consecrated, first by the Greeks and then by the Romans, as an emblem of victory, and whose fruit has been a principal article of food in the East, from the remotest antiquity to the present day. The word *Palma* is supposed to have been applied to this tree, from the divisions of its leaves having some resemblance to the fingers and palm of the hand, whence perhaps, by an association of ideas, the fruit came to be called *dactyli*, from *δακτυλος*, a finger, to which its likeness is, at first, not apparent. The Greeks named this kind of Palm *φαινίξ*; which Linnæus has retained. (See PHOENIX.) That great botanist terms the natural order in question "Princes of the Vegetable kingdom, of Indian origin, distinguished by their sheathed and many-spiked flowers, their flowing habit, their lofty stature, the simple elegance of their unbranched long-enduring stem, the leafy evergreen garlands with which they are crowned, and their princely treasures of rich fruit. They are tributary to the first order, or *Primates*, amongst animals; more especially to the lord of the animal creation, who is destined, in a state of nature, to dwell among them."

Palmæ constitute the eleventh order in the system of Jussieu, the first of his third class. The character of that class is a simple *cotyledon*, with *stamens* inserted into the *calyx* or *corolla*. The class is thus defined at length by Jussieu.

Calyx of one leaf, tubular or deeply divided, superior or inferior, sometimes naked, but mostly accompanied by a sheath, containing one or many flowers, rarely by an involucre, resembling an outward calyx. *Corolla* none, for what is so termed by Tournefort, Linnæus and others, Jussieu reckons a true calyx, as above. *Stamens* definite in number, rarely indefinite, inserted into the lower or the upper part of the calyx, opposite to its segments; their filaments usually distinct, rarely combined, with distinct two-celled anthers. In a few cases the *germens* are more than one, superior, with the same number of *styles* and of *stigmas*, each *germen* becoming a *capsule* of one cell, either with a single *seed* or with several, in which latter case the capsule consists internally of two valves, to whose margins the *seeds* are annexed. More frequently, however, the *germen* is solitary, either superior or inferior; the *style* solitary, rarely three, or wanting; *stigma* simple, or divided; *fruit* pulpy, or capsular, of three cells, containing three or many *seeds*; sometimes two of the cells prove abortive, and one *seed* only of the whole is perfected. The *seeds* of the pulpy kinds are attached to the internal angle of their cells; in those furnished with *capsules*, usually of three valves, they are inserted here and there, upon the margin of an elevated receptacle, constituting the partition, in the middle of each valve, and separating along with it. The *corculum* is small, in a large horny *albumen*.

The orders of this class are eight, *Palmæ*, *Asparagi*, *Junci*, *Lilia*, *Bromelia*, *Asphodeli*, *Narcissi* and *Irides*.

The same author thus characterizes the *Palma*. *Calyx* in six deep segments, often permanent, the three outer segments often smallest. *Stamens* six, rarely more or fewer, inserted into the base of the segments of the calyx, or rather perhaps into a glandular body situated beneath the germen, their filaments often combined at the bottom. *Germen* superior, simple, rarely three-fold (in *Chamerops*); *style* one or three; *stigma* simple or three-cleft. *Fruit* a berry, or a drupa, in the latter case internally reticulated, each of one or three cells, and with one or three bony *seeds*. *Corculum* very small, in a cavity at the base or side, rarely at the base, of a large *albumen*, which is at first soft and eatable, but subsequently hardened and horny.

The *stem* is simple, cylindrical, like the trunk of a tree, shrubby or arborescent, either scaly with the permanent bases of the leaves, or rough with the circular scars where the bases of old leaves have been. *Leaves* terminal, crowded, alternate, sheathing at their base; the young ones folded, and either covered or surrounded with the reticulated sheaths of last year's leaves, remaining between their bases. *Spadix* central among the leaves, terminal, many-flowered, either simple, or more frequently branched, each branch accompanied by a pair of *sheaths*, and the whole enclosed in one very large common *sheath*, mostly simple, rarely of several leaves. *Flowers* either diœcious or monœcious, but perhaps from the abortion of one or other of the organs of impregnation in each; the sexes situated on the same spadix or on a separate one; rarely hermaphrodite, each flower accompanied by two short sheaths.

Mr. Brown, *Prodr. Nov. Holl.* v. 1. 266, remarks that the *flowers* are hermaphrodite (or united), though often polygamous, and that the *stamens* in some of the polygamous palms are indefinite in number. The *stem*, when shrubby, is sometimes branched. The same author adds that *Palmæ* are certainly widely removed from *Gramina*, having apparently more affinity to the *Junci*, through the medium of *Xerotes* and *Flagellaria*.

This order is divided into two sections, according to the structure of the foliage.

1. Leaves pinnate, contains *Calamus*, *Phœnix*, *Arcaea*, *Flatz*, *Cocos*, *Elais*, *Caryota*, *Nipa*; to which Willdenow has added *GEONOMA*, and Brown *SEAFORTHIA*; see those articles.

2. Leaves palmate, or fan-shaped, comprehends *Corypha*, *Licuala*, *Latania* of Commerçon, *Borassus*, which Jussieu is pleased to call *Lontarus* after the example of Rumphius, and *Chamerops*; to which are to be added *Thrinax* of Swartz, and *Rhapis* of the younger Linnæus, see Ait. Hort. Kew. ed. 1. v. 3. 473; as well as *LIVISTONA*, Brown Prodr. 267; see that article.

Of the internal structure of the *Palmæ* we have already given some idea, in speaking of the great natural class to which they belong. (See *MONOCOTYLEDONES*.) The following account of their vegetation, extracted from Desfontaines, is published in Lamarck's Dict. v. 4. 701.

"When the seed of a Palm-tree is committed to the earth, the leaves unfold in succession, and increase in number, during four or five years. The crown of the root dilates in the same proportion. The bulb, formed by the re-union of the footstalks of the leaves, swells insensibly, its solidity gradually augments, and at length the stem rises above the surface of the ground, of the full diameter that it ever will acquire. The leaves, produced every spring, originate always from the summit. The older ones, standing below the others, gradually dry up, and, on separating from the stem, leave behind them circular impressions, which furrow its surface, and mark the years of its age, as long as it continues

tinues to grow. The stem is exactly cylindrical from top to bottom, and if its measure be taken at different periods, no increase of diameter will ever be discovered. This fact did not escape Kæmpfer." The same able writer remarks nevertheless, that Palm-trees are liable to accidental irregularities in their growth, either from a deficiency of nourishment, whence they become slender in that portion of their stems elongated under such circumstances; or from a superabundance of food, whence the new part proves of a greater diameter than the old; for the latter retains, in both cases, its original dimensions. Such being the mode of increase in the plants of this natural order, and their duration very long, amounting sometimes to 800 years or more, no wonder that they attain an extraordinary degree of elevation, much exceeding the generality of trees, though scarcely equal to the Norfolk Island Pine. (See DOMBEYA.) Yet, notwithstanding this great loftiness of growth, botanists have doubted whether they strictly ought to be denominated trees or herbs. They certainly have not the proper trunk, gradually augmented by successive annual concentric layers, which is characteristic of a tree or shrub. Their annual circles of leaves all spring in reality from the root, or at least from its singularly protruded crown; but so little of any such protrusion is discernible in herbaceous plants, which die down to the surface of the earth every winter, that the difference between them and the Palm tribe is abundantly marked. Linnæus, not knowing whether to call their foliage leaves, adopted the term *frons*, a frond or bough; but, as it seems to us, without any necessity. That they were, by the ancients, very improperly termed branches, we readily allow, but the objections that "they have no bud for the following year, neither have they the substance of leaves, nor do they, like leaves, all wither and fall off together," see *Linn. Præleç. in Ord. Nat.* 23, appear to us very unsatisfactory. They have, in fact, a central bud, like trees of tropical countries, though not the scaly *hybernacula* appropriated to those of cold climates; their substance is much like that of a variety of other leaves; and they fall off in succession, like the foliage of other evergreen plants. When their whole summit is cut off, the plant perishes, they having no power of producing lateral buds.

The botanical arrangement of *Palme* was, in the early days of Linnæus, a work of considerable difficulty. Tournefort had distinguished no proper genera in this order, nor Plumier more than one. So imperfect were the accounts of their flowers in early botanical works, and so impossible was it for the author of the sexual system to procure access, in most instances, to the reality, that he could not ascertain enough of their structure to refer more than a very few to his classes and orders; hence he assembled as many as he knew of the family, in an appendix to his system, except *Calamus*, of whose relationship to the rest he was not aware. Linnæus, on the other hand, confounded with the *Palme Cycas* and *Zamia*, which are more nearly allied to the *Filices*, though properly distinct from both. These genera are now referred by Pearson and Brown to a separate order, under the name of *Cycadæ*. See *Br. Prodr. Nov. Holl.* v. 1. 346.

Mutis paid great attention to the *Palme* of South America, but his remarks and descriptions have only in part reached us. Dr. Roxburgh's work, on the plants of Coromandel, has thrown much light on the East Indian Palms. Thunberg has, long ago, ascertained so much of their fructification, as to refer most of the established genera to their places in the Linnæan artificial system, where they chiefly belong to the class *Hexandria*, like their near relations the *Liliaceæ*. The native country of the greater part of the

Palme is within the tropics. The requisite degree of heat, and the space, which they occupy in a hot-house, as well as their tardy growth, and backwardness in flowering, render them difficult of cultivation, and prevent their being general in collections. The stoves of the late marchioness of Rockingham at Hillingdon were splendidly furnished with some of these Princes of the vegetable kingdom, as are those at Kew, and the long established ones of J. Blackburn, esq. at Orford, Lancashire.

PALMAJOLA, in *Geography*, a small island in the Mediterranean, near the coast of Italy. N. lat. $42^{\circ} 53'$. E. long. $9^{\circ} 35'$.

PALMAR, a river of Africa, in Benin, which runs into the Atlantic, N. lat. $6^{\circ} 25'$. E. long. 3° .

PALMAR Point, a cape on the west coast of Africa. S. lat. $5^{\circ} 30'$.

PALMAR, a town of South America, in the audience of Quito; 40 miles S.W. of Riabamba.

PALMARIA, a small island in the Mediterranean, about 45 miles from the coast of Naples; 3 miles W. from the island of Ponza. N. lat. $40^{\circ} 58'$. E. long. $12^{\circ} 53'$.—

Also, a small island in the Mediterranean, near the coast of Genoa, at the entrance of the gulf of Spezza; 8 miles S. of Spezza. N. lat. $44^{\circ} 4'$. E. long. $9^{\circ} 40'$.

PALMARIGI, a town of Naples, in the province of Otranto; 3 miles W.S.W. of Otranto.

PALMARIS *Longus et Brevis*, in *Anatomy*, two muscles of the fore-arm. See FASCIA.

PALMARIS *Fascia*. See FASCIA.

PALMAROLA, in *Geography*, a small island in the Mediterranean, near the coast of Naples, about three miles long from north to south, and very narrow; 4 miles W. of Ponza. N. lat. $41^{\circ} 3'$. E. long. $12^{\circ} 55'$.

PALMAS, a small island in the Pacific ocean, near the coast of Peru. N. lat. $4^{\circ} 35'$.—Also, a town of South America, in the province of Tucuman; 30 miles S. of St. Miguel de Tucuman.—Also, one of the Philippine islands, near the south-east coast of Mindanao.—Also, a river of Mexico, which runs into the bay of Campechy, N. lat. $18^{\circ} 20'$. W. long. $94^{\circ} 20'$.—Also, a town of North America, formed by the union of the rivers Nicas and Saucedo, in New Biscay, and which, thus united, traverses the province of New Leon, and then falls into the gulf of Mexico, N. lat. 25° . W. long. $98^{\circ} 56'$.

PALMAS, or *Palmez*, the chief town of Gomera, one of the Canary islands.

PALMAS, *Cape*, a cape of Africa, on the Grain coast. N. lat. $4^{\circ} 30'$. W. long. $7^{\circ} 41'$.

PALMATED-ROOTS, in *Botany*, are tuberose roots of a flattish shape, and divided into several oblong and slender branches, resembling so many fingers. Of this sort are the roots of some of the orchid kind, called hence palmated.

PALMATED-Stones, *Pa'mati Lapidés*, in *Natural History*, a name given by the ancients to a sort of stones, which were always found of the shape of a hand with its fingers. They were frequent in Spain; and some, which were found of a fine black, were reputed to be a kind of marble. The greater number were white, and were composed of the matter of one of the softer and less beautiful quarry-stones.

PALMATIAN HORSES, in the *Manege*, Cappadocian horses, which, together with the *Hermagenian*, were reckoned the noblest and first in merit. They were so prized, that they were devoted to the sole use and pleasure of the emperors, and they were not allowed to be sold without express licence or permission. With the Palmatian and Her-

magenian horses it was usual to couple Phrygian mares; and the produce of this mixture, especially if derived from the horses of Argæus, a mountain in Cappadocia, were thought the finest and best for the labours of the circus, to which they were always pre-eminently devoted, both at Constantinople and at Rome. The Palmatian horses owe their name to a person called Palmatus or Palmatus, who was rich in a most valuable breed of horses, whose possessions being seized and confiscated, his horses were appropriated to the emperor, and formed the most valuable part of the *græd dominicus*, or imperial stables. Palmatus is said to have resided at Andibilis, a town of Cappadocia, not far from mount Taurus; and living in a country productive of fine horses, by his knowledge and care he raised so generous a breed, that they have at the same time perpetuated his fame and their own. The Hermagenian horses were reckoned next, if not equal in repute, to the Palmatian race. These were so denominated from Hermagenes Ponticus, who was a general of horse under the emperor Constantius, and is supposed to have been the founder of this distinguished kind of horses, whose praises have descended to these times. *Beutinger's History, &c. of Horsemanship, vol. i.*

PALMATUM FOLIUM, in *Botany*, a Palmate Leaf, is, like those of the Common Fig, and the *Alcea ficifolia*, with several of the Mallow tribe, deeply divided into oblong finger-like segments; but still so as to leave an entire portion, like the palm of the hand, of greater or less extent, at the base. See **LEAF**.

PALMAW, in *Geography*, a town of Bengal; 24 miles S.S.W. of Rogonapour. N. lat. 23° 13'. E. long. 86° 54'.

PALMEIRA, a small island in the Persian gulf, near cape Bardistan.

PALMELA, a town of Portugal, in Estramadura, with a castle on a rock; 6 miles N. of Setuval.

PALMER, in our *Ancient Writers*, is used for a pilgrim, and sometimes for a croise, on account of a staff made of the palm-tree, which they ever afterwards bore as a badge of their devotion. See **PILGRIM** and **CROISES**.

PALMER, in *Geography*, a township of America, in Hampshire county, Massachusetts, on the south side of Chickapee river, and bounded eastward by Western or Worcester county; incorporated in 1752, and containing 1039 inhabitants.

PALMERA, CAPE, a cape on the east coast of the island of Formentera. N. lat. 38° 42'. E. long. 1° 30'.

PALMERIN, a town of Africa, in Beol, where is a mart for hides and teeth. N. lat. 13° 50'. W. long. 16° 21'.

PALMERO, CAPE, a cape on the east coast of the island of Sardinia. N. lat. 39° 40'. E. long. 9° 56'.

PALMERSTON, CAPE, a cape on the north-east coast of New Holland. S. lat. 21° 30'. W. long. 210° 54'.

PALMERSTON'S Island, an island in the South Pacific ocean, discovered by captain Cook in June 1774. In the "Missionary Voyage," it is described as a group of small islets, eight or nine in number, connected together by a reef of coral rocks, and lying in a direction nearly circular. Captain Wilson and some of his companions landed upon one of these isles, which is not a mile in circuit, and which, at high water, is not more than four or five feet above the level of the sea. The soil is coral sand, with an upper stratum of blackish mould, produced from rotten vegetables. The inner area of the islet is covered with cocoa-nut trees, which, decaying and falling, form a thick underwood. They saw a number of men of war birds, tropic birds, and boobies. Among the trees there was plenty of red crabs,

dragging after them a shell in form of a periwinkle, but larger, being in diameter about two or three inches. When they ran along the ground, they only put their claws out; but being touched, they withdrew themselves wholly into their shell. Here they saw the submarine grotto, described in Cook's Third Voyage. At one part of the reef which bounds the lakes within, almost even with the surface, there is a large bed of coral, which affords a most enchanting prospect. Its base, which is fixed to the shore, extends so far that it cannot be seen, so that it appears to be suspended in the water. The resplendence of the sun, when the sea is unruffled, exposed to view the various sorts of coral in the most beautiful order; some parts luxuriantly branching into the water, others appearing in a vast variety of figures, and the whole heightened by spangles of the richest colours, glowing from a number of large clams interspersed in every part. This scene was much improved by the multitude of fishes that gently glided along, seemingly with the most perfect security: their colours were the most beautiful that can be imagined, blue, yellow, black, red, &c. far excelling any thing that can be produced by art. Our navigators observe, that no traces appear of this island's ever having been inhabited. S. lat. 18° 4'. W. long. 163° 10'.

PALMETTO, in *Botany*. See **CHAMÆROPS**.

PALMETTO-Royal, a name given by Ligon to a tree of the palm kind. Its trunk is very tall and straight, and hollowed regularly in the centre; yet so tough, that it is never blown down, nor destroyed by storms. It is recommended for making long telescopes for celestial observations.

PALMETTO, in *Geography*, a town of the island of St. Christopher, situated on a bay to which it gives name; 3 miles W. of Basse-Terre.

PALMETTO Point, a cape on the north coast of Jamaica. N. lat. 18° 18'. W. long. 76° 20'.—Also, a cape on the south coast of Jamaica. N. lat. 18° 7'. W. long. 77° 57'.

PALMIERI, MATTEO, in *Biography*, an Italian man of letters, born at Florence about 1405, was descended from an ancient and illustrious family, and educated in the sciences and learned languages under the ablest masters. In 1437 he was present, in some public capacity, at the general council of Florence. He was several times entrusted by his fellow-citizens with offices of magistracy, and rose to the supreme dignity of gonfalonier of justice. He was likewise appointed several times to important embassies to the popes, the emperor Frederic III., Alphonso king of Naples, the republic of Sienna, and other states. He died in 1475, at the age of 70. As a literary man, his most considerable work was a Chronicle from the creation down to his own times. He also wrote "The Life of Niccolò Acciajuoli," which has been published by Muratori; as likewise has his book, "De Captivitate Pisorum;" and a work in form of a dialogue, "Della Vita Civile," several times printed and translated into French. The Chronicle, already mentioned, was continued to the year 1482, by a native of Pisa, very nearly his namesake, *viz.* Mattea Palmieri, who was apostolic secretary, and died in 1483.

PALMINOPOS, in *Geography*, a town of Spain, in New Castile; 25 miles N.N.W. of Cuenca.

PALMIPÉDES, WEB-FOOTED, in *Ornithology*, the name of an order of birds living about waters, and furnished by nature with feet for swimming.

This order corresponds to the Anseres of Linnæus, and comprehends two divisions, *viz.* those with long legs, and those with short legs. The characters of the former are, that the body is conical and somewhat flattened; the thighs are naked on their lower halves; the legs are very long; the feet

feet are fitted for wading; and the toes are only connected together at their posterior parts by a membrane, so that they are "semipalmati." These birds mostly pair in breeding time, and build their nests on the ground. They feed in the water, on small fishes and various insects; and, especially when young, are good food. The second division comprehends those called "palmati," the characters of which are, that the bill is smooth, covered with a membranous skin, and increasing in size towards the point. The feet are fitted for swimming, having short legs, which are thin, or compressed laterally; and the toes are all connected, to their ends, by an interposed membrane. These birds are mostly polygamous, one male associating with many females. They build their nests chiefly on the ground, and the mother seldom takes any trouble in feeding the young, which are very soon able to provide for themselves. They live very much in the water, feeding on aquatic plants, fishes, and other substances; and their flesh has generally a rancid fishy flavour. To the former division belong the avocet, courier, and flamingo; and to the latter, the duck, merganser duck, penguin, petrel, albatross, pelican, darter, tropicker, guillemot, diver, gull, tern, and skimmer.

PALMIPES, among the Romans, a long measure, containing a foot and a palm, or five palms; and was less than the cubit by one palm.

PALMIRAS, POINT, in *Geography*, a cape of Hindoostan, on the coast of Cattaek, in the bay of Bengal, anciently called "Promontorium Calington." N. lat. $20^{\circ} 44'$. E. long. $87^{\circ} 5'$.

PALMISTRY, a kind of divination, performed by inspecting the lines and marks of the hands and fingers; called also *chiromancy*; which see.

PALMO, in *Commerce*, a long measure in Italy, Spain, and Portugal. At Genoa, the palmo corresponds to $109\frac{1}{2}$ French lines, or $9\frac{3}{8}$ English inches. The canna is of three sorts; the canna piccola, used by tradesmen and manufacturers, = 9 palmi, or $87\frac{1}{2}$ English inches; the canna grossa, used by merchants, = 12 palmi, or $116\frac{1}{8}$ English inches; and the canna, used at the custom-house, = 10 palmi, or $97\frac{1}{2}$ English inches.

In Portugal, the palmo is equal 8 pollegadas = 8.64 English inches; each pollegada or inch is divided into 12 linhas or lines, and each linha into 10 pontos or points. This is called the "palmo de cravada," or standard span, being the legal measure of the kingdom; and all other measures, derived from it, are likewise distinguished by the same term. See VARA and PORTUGAL. For the palmo of Spain, see SPAIN. See also *Tables of WEIGHTS and MEASURES*.

PALMS, among *Botanists*, white buds shooting out of willows, or fallows, before the leaf; of the expansions of which the flowers of that tree are formed.

PALMS, *Isle of*, in *Geography*, a narrow island on the coast of Africa, at the entrance of the river Senegal, about six miles in length.

PALM-SUNDAY, DOMINICA PALMARUM, the Sunday next before East Sunday; or the last Sunday in Lent.

It has been thus called from the primitive days, on account of a pious ceremony then in use, of bearing palms, in memory of the triumphant entry of Jesus Christ into Jerusalem, eight days before the feast of the passover, described by St. Matthew, chap. xxi. St. Mark, chap. xi. and St. Luke, chap. xix.

The ancients had other names for this day. For, 1. They called it *Dominica Competentium*, i. e. *Sunday of the Competentes*; because, on that day, the catechumens came to ask

the bishop leave to be admitted to baptism, which was conferred the Sunday following.

They had also then given them the symbol, or credo, to get off by heart, to be repeated to the bishop in the ceremony of baptism.

2. They called it *Capitulivium*, the Sunday of washing the head; because those who were to be baptized the following Sunday, were prepared by washing their heads on this day.

Some time afterwards they called it *Indulgence Sunday*, because the emperors and patriarchs used to distribute gifts on that day.

PALMULARII, more properly called PARMULARII, in *Antiquity*, a sort of gladiators, who fought armed with a sort of little buckler, called *parma*; which see.

PALMYRA, RUINS OF, or *Palmyrene Ruins*, in *Ancient and Modern Geography*, are the ruins of a famous city of this name, situate in a desert of Syria, in the pachalic of Damascus, about 48 leagues from Alepp, and as far from Damascus, 85 miles west from the Euphrates, and about 117 miles from the Mediterranean, and in N. lat. $34^{\circ} 20'$. E. long. $38^{\circ} 48'$. This city appears to have been originally built by Solomon, and called Tadmor. (1 Kings, ix. 18. 2 Chron. viii. 4.) Josephus assures us, that this was the same city which the Greeks and Romans afterwards called Palmyra; and it is still called Tadmor by the Arabs of the country. But many circumstances, besides the style of the buildings, render it probable that the present ruins are not those of the city built by Solomon, though neither history nor tradition mention the building of any other.

The site of Palmyra is one of those few cultivated spots, which rise in the deserts of Arabia and of Egypt, like islands out of the sandy ocean. (See OASIS.) The name of Tadmor, or Palmyra, by its signification in the Syrian, as well as in the Latin language, denoted the multitude of palm-trees which afforded shade and verdure to that temperate region. It is needless, therefore, to recur to the etymologies, suggested by Hesychius and Dr. Halley (*ubi infra*). The air on this spot was pure, and the soil, watered by some invaluable springs, was capable of producing fruits, as well as corn. A place possessed of such singular advantages, and situated at a convenient distance between the gulf of Persia and the Mediterranean, was soon frequented by the caravans, which conveyed to the nations of Europe a considerable part of the rich commodities of India. Palmyra insensibly increased into an opulent and independent city, and, connecting the Roman and the Parthian monarchies by the mutual benefits of commerce, was suffered to observe an humble neutrality, till at length, after the victories of Trajan, the little republic sunk into the bosom of Rome, and flourished more than 150 years in the subordinate though honourable rank of a colony. It was during that peaceful period, if we may judge from a few remaining inscriptions, that the wealthy Palmyrenians constructed those temples, palaces, and porticoes of Grecian architecture, whose ruins, scattered over an extent of several miles, have attracted the curiosity of our travellers.

History is silent as to the fate and circumstances of this city during the great revolutions in the several empires of the East; but it may well be supposed, that so advanced a garrison as this was, being above 300 miles from Jerusalem, continued not long in the possession of the Jews, who immediately after Solomon fell into civil dissention, and divided their force; so that, without doubt, it submitted to the Babylonian and Persian monarchies, and afterwards to the Macedonians, under Alexander and the Seleucidæ. But when the Romans advanced to these parts, and the Parthians

seemed

PALMYRA.

seemed to put a stop to their farther conquests in the East, then was this city of Palmyra, by reason of its situation, being a frontier, and in the midst of a vast sandy desert, where armies could not well subsist to reduce it by force, courted and caressed by the contending princes, and permitted to continue a free state, a mart or staple for trade, for the convenience of both empires, as we learn from the information both of Appian and Pliny. Palmyra is first mentioned by the Roman historians as a place which Mark Antony, after his victory at Philippi, about 40 years B. C. attempted to plunder, pretending that it had not observed a just neutrality between the Romans and Parthians. When the Romans, under Trajan, had made it appear by his victories, as we have already said, that there was no comparison between their power and that of the Parthians (Trajan having taken Babylon and Ctesiphon, the seat, at that time, of the Parthian empire), the Palmyrenes were induced to declare for the Romans; which they did, by submitting themselves to the emperor Adrian, about the year of Christ 130, when Adrian made his progress through Syria into Egypt. This magnificent emperor, being highly delighted with the situation and native strength of the place, situated on an extensive plain, and surrounded on three sides by a long chain of mountains, determined to furnish it with various splendid edifices and ornaments; and at this time he probably conferred upon it the privileges of a "Colony Juris Italici," which, as we learn from Ulpian, it actually enjoyed, and the inhabitants of the city were induced by gratitude to call themselves "Hadrianopolitæ." Many of its marble pillars, particularly those of the long porticos, were probably the gift of this emperor. In the time of Caracalla it was a Roman colony; and from Adrian to Aurelian, for about 140 years, it continued to flourish and increase in wealth and power to a very considerable degree; and the Palmyrenes, who assisted Alexander Severus against the Parthians, were again conspicuous in the reign of Gallienus, under Odenathus, who, when the emperor Valerian was taken prisoner by Sapor, king of Persia, brought a powerful army into the field, recovered Mesopotamia from the Persians, and penetrated as far as their capital city Ctesiphon, and who, for this service to the Roman state, was made the associate of Gallienus in the empire. He was succeeded by Zenobia his queen, who broke the alliance with Gallienus, and made herself sole mistress of Syria and Mesopotamia. (See the biographical article ZENOBIÆ.) At length Aurelian, having taken Palmyra, A. D. 273, after a long siege, by means of his light horse pursued Zenobia, who had mounted the fleetest of her dromedaries, and had reached the banks of the Euphrates, about sixty miles from Palmyra, and having seized the princess, carried her to Rome, to grace his triumphs, and with her, her secretary Longinus, known for his admirable work on the Sublime, who was put to death. Her capital was treated with unexpected lenity. The arms, herds, and camels, with an immense treasure of gold, silver, silk, and precious stones, were all delivered to the conqueror. The city revolting in her absence, Aurelian returned and destroyed it, putting to death most of the inhabitants, without regard either to age or sex. Little is known concerning the state of Palmyra since the time of Mahomet, except that it was considered as a place of strength, and that in the 12th century there were two thousand Jews in it. Aurelian himself had lamented the destruction to which he had devoted it: and he not only manifested a concern for the re-establishment of the temple of the Sun, but he granted to the few Palmyrenians, who had survived the slaughter which he had ordered, the permission of rebuilding and in-

habiting their city. But it is easier to destroy than to restore. The seat of commerce, of arts, and of Zenobia, gradually sunk into an obscure town, a trifling fortress, and at length a miserable village. The present citizens of Palmyra, consisting of thirty or forty families, have erected their mud-cottages within the spacious court of a magnificent temple.

With respect to the ruins, they appear to be of two different and distinct periods; the oldest are so far decayed as not to admit of mensuration, and seem to have been reduced to that state by the hand of time; the other appear to have been broken into fragments by violence. Of the inscriptions, none are earlier than the birth of Christ, and none are later than the destruction of the city by Aurelian, except one, which mentions Dioclesian. It is scarcely less difficult to account for the situation of this city than for its magnificence; the most probable conjecture is, that as soon as the springs of Palmyra were discovered by those who first traversed the desert in which it is situated, a settlement was made there for the purpose of carrying on the trade of India, and preserving an intercourse between the Mediterranean and Red sea. This trade, which flourished long before the Christian era, accounts not only for its situation, but also for its wealth. As it lay between Egypt, Persia, and Greece, it was natural to expect, that traces of the manners and sciences of those nations should be discovered among the Palmyrenes; who accordingly appear to have imitated the Egyptians in their funeral rites, the Persians in their luxury, and the Greeks in their buildings; and therefore the buildings, which now lie in ruins, were probably neither the works of Solomon, nor of the Seleucids, nor, few excepted, of the Roman emperors, but of the Palmyrenes themselves.

Palmyra was formerly encompassed by palms and fig-trees, and covered an extent of ground, according to the Arabs, near ten miles in circumference; and might probably have been reduced to its present confined and ruined state by quantities of sand, driven over it by whirlwinds. The walls of the city are flanked square towers; and it is probably by their general direction, that they included the great temple, and are three miles in circumference. But of all the monuments of art and magnificence in this city, the most considerable is the temple of the Sun. The whole space containing its ruins, is a square of two hundred and twenty yards, encompassed with a stately wall, and adorned with pilasters within and without, to the number of sixty-two on a side. Within the court are the remains of two rows of very noble marble pillars, thirty-seven feet high; the temple was encompassed with another row of pillars fifty feet high; but the temple itself was only thirty-three yards in length, and thirteen or fourteen in breadth. This is now converted into a mosque, and ornamented after the Turkish manner. North of this place is an obelisk, consisting of seven large stones, besides its capital, and the wreathed work about it, about fifty feet high, and just above the pedestal, twelve in circumference. Upon this there was probably a statue which the Turks have destroyed. At a small distance there are two others, and a fragment of a third, which gives reason for concluding that they were once a continued row. There is also a piazza forty feet broad, and more than half a mile in length, inclosed with two rows of marble pillars, twenty-six feet high, and eight or nine feet in compass; and the number of these, it is computed, could not have been less than five hundred and sixty. Near this piazza appear the ruins of a stately building, supposed to have been a banqueting house, elegantly finished with the best sort of marble. In the west side of the piazza there are several apertures for gates into the court of the palace, each adorned with four porphyry

porphyry pillars, thirty feet long, and nine in circumference. There are several other marble pillars differently arranged, on the pedestals of which there appear to have been inscriptions, both in the Greek and Palmyrene languages, which are now altogether illegible. Among these ruins there are also many sepulchres, which are square towers, four or five stories high, and varying in size and splendour. We are indebted for an account of these very magnificent remains of antiquity, partly to some English merchants who visited them in 1678 and 1691, (Phil. Transf. N^o 217, 218, or Lowthorp's Abr. vol. iii.), but chiefly to M. Bouverie and Mr. Dawkins, accompanied by Mr. R. Wood, who travelled thither in 1751. The result of their observations was published in 1753, in the form of an Atlas, containing fifty-seven copper plates, admirably executed. Since this publication, it is universally acknowledged that antiquity has left nothing, either in Greece or Italy, to be compared with the magnificence of the ruins of Palmyra.

PALMYRA, in *Geography*, a post-town of America, and the only port of entry and delivery in the state of Tennessee; so constituted by a law of the United States in 1797; situated on the south bank of Cumberland river.

PALNAUD, a country of Hindoostan, which is a district belonging to the Carnatic, but situated towards the Kistnah river, on the W. of Guntoor. The principal place in it is Timerycotta.

PALO, a town on the E. coast of the island of Leyta. N. lat. 11° 15'. E. long. 124° 55'.—Also, a cape on the coast of Albania; 6 miles N.W. of Durazzo.—Also, a town of Naples, in the province of Bari; 3 miles W. of Bittetto.—Also, a town in Patrimonio, on the sea-coast, defended by a strong castle; 13 miles W.N.W. of Rome.

PALO, Cape, a cape on the coast of Albania, in the Adriatic. N. lat. 41° 44'. E. long. 19° 10'.

PALOCZA, a town of Hungary; 11 miles E. of Szeben.

PALOMAR, a town of Spain, in Aragon; 22 miles N. of Teruel.

PALOMBARA, a town of Naples, in Lavora; 5 miles N.E. of Capua.

PALOMERA, or **PALUMARIA**, a sea-port town on the N.E. coast of the island of Majorca. The port is covered by a rocky island, called by the ancients "Columbria." Some coral has been found on this coast, and in the rocks.

PALOMINOS, small islands on the coast of Peru, three miles W. of St. Lawrence island.

PALONGOLA, a town of Congo, on the Lelanda; 2 miles S. of St. Salvador.

PALONGONG, a town of Matamba; 70 miles S.E. of St. Maria de Matamba.

PALOS, a gulf in the straits of Macassar, near the W. coast of Celebes. S. lat. 0° 24'. E. long. 119° 15'.—Also, a town on the W. coast of Celebes, in a bay to which it gives name. S. lat. 0° 56'. E. long. 119° 39'.—Also, a sea-port town of Spain, in the province of Seville, at the mouth of the Tinto, in which is a tolerable harbour formed by the tide. In the year 1492 Columbus failed from this port, on his first voyage for the discovery of the new world; 2 miles S. of Moguer. N. lat. 37° 10'. W. long. 6° 58'.

PALOS, Cape, a cape of Spain, on the coast of Murcia. N. lat. 37° 37'. W. long. 0° 48'.

PALOTTA, a town of Hungary, with a castle, and fortified with a high wall and a moat; 8 miles W.S.W. of Stuhl-Weisenburg.

PALOTZA, a town of Hungary, on the river Poprat; 54 miles N. of Caschau.

PALOU, a town of Asiatic Turkey, in the government

of Diarbekir; 60 miles N. of Diarbekir. N. lat. 38° 52'. E. long. 39° 40'.

PALOUÉ, and **PALOVEA**, in *Botany*. See **GINANNIA**.

PALPABLE, something that may be perceived by the senses, especially by the sense of feeling. Hence impalpable powder.

PALPEBRÆ, in *Anatomy*, the eyelids. See **EYE**.

PALPEBRÆ Superioris Levator, a muscle belonging to the upper eyelid. See **EYE**.

PALPEBRALIS CONJUNCTIVA, that portion of the membrane which lines the eyelids. See **EYE**.

PALPEBRARUM ORBICULARIS, a circular muscle, surrounding the opening of the eyelids. See **EYE**.

PALPETER, in *Geography*, a town of Candahar, in the Cabulistan; 50 miles E. of Ghizni.

PALPITATION, in *Medicine*, a vehement and inordinate action of the heart. This affection is very various in respect to the degree of its violence, and of the distress which accompanies it, as well as in regard to the actual morbid changes of which it is symptomatic, and therefore to the degree of impunity or danger with which it may occur. For it appears under all the gradations of severity, from the slight beating occasioned by active exercise, or a sudden emotion of the mind, to the most tremendous convulsions of the heart and arteries, which are not only perceptible to the touch of others, but are obvious to the sight, and even sometimes to the hearing of by-standers. It is, indeed, only to the more severe instances of the disease to which the term is applied in a medical view, and such only which it is the object of this article to describe.

This morbid pulsation of the heart is seldom constant in its vehement degree, for that would be inconsistent with the continuance of the functions of life; it sometimes continues in a minor degree, *i. e.* the ordinary action of the heart is carried on with more force than is natural, and with a constant sense of oppression about the region of the præcordia. But, in general, the palpitation occurs in paroxysms, at uncertain intervals, and, after continuing with extreme violence for a short space of time, then ceases, the heart resuming its ordinary moderate and measured action.

The *fit of palpitation* is extremely distressing. It is usually sudden in its attack, beginning instantaneously in all its violence, from the operation of very slight causes, or frequently without any obvious excitement. The slightest jar of the body occasioned by a false step, or slip of the foot, in walking,—any emotion of the mind,—certain impressions upon the stomach, arising from flatulence, acidity, or particular food or drink,—or even the mere distention of the stomach by a meal, will give rise to the paroxysm in those who are subject to the disease. Sometimes it comes on in the night; and certain positions of the body, such as lying on the left side, and compressing the heart, will occasionally produce it; and, in other cases, it recurs at regular periods, like the paroxysm of an intermittent.

The distress which accompanies the paroxysm, is not occasioned by the mere violence of the contractions of the heart, and by its blows against the ribs; but arises also from the complicated sensations of oppression and disturbance, which are produced in the different organs of the body, especially in the brain and lungs, by the torrents of blood, rapidly and vehemently injected into them from the labouring heart. The spasmodic motions of this viscus are commonly visible at a considerable distance from the sufferer, by the motion of his garments, by which his pulse may be counted; and if he is stripped, the successive projection and collapse, not only of the ribs, but even of the pit of the stomach and abdomen, are very visible. At the same time, the violent palpitations

PALPITATION.

pulsations of the carotid arteries, and even of the jugular veins in the neck, which successively elevate the coverings of that part, evince the impetus with which the blood is projected through them. The extreme sufferings of the patient under these circumstances are depicted in his countenance, which is at once expressive of anguish, oppression, helpless imbecility, and terror. In the chest, the sense of suffocation, of load, and anxiety, often with acute pain in the præcordia, increases the oppression which the vehement pulsation occasions: while in the head, the pain is commonly most severe, and every stroke of the arteries is felt, and even heard, like the blows of a hammer; and in a short time, confusion of the senses, ringing of the ears, and giddiness, ensue; while the whole frame suffers with this disturbance of the sensorium, and tinglings, tremors, and spasmodic twitches of the limbs, alarm the patient with the expectation of immediate paralysis. At length, sometimes gradually, but sometimes instantaneously, and not unfrequently with one most violent stroke, the heart resumes its calm and ordinary pulsations, and all these distressing sensations are immediately relieved. As in all cases of violent excitement, however, the patient is left in a state of considerable languor and lassitude, which sometimes goes to the extent of syncope, and the respiration is for a little while laborious, and accompanied with sighing. If, indeed, there is considerable organic derangement, this oppressed state of respiration continues more or less, together with anxiety in the præcordia.

During the continuance of the paroxysm, the vehemence of the palpitation often varies, being at times diminished, and again increasing; the pulse is very various in different instances, sometimes being extremely full and strong, according with the action of the heart, and sometimes remarkably small and feeble; sometimes intermitting and unequal, sometimes perfectly regular, and sometimes not corresponding in its beats with the pulsation in the chest. Before the termination of the paroxysm, the extremities often become cold, and the surface of the body, especially of the face and extremities, becomes livid, from the imperfect transmission of blood through the extreme vessels; sometimes there are alternate chills and heats.

The duration of the paroxysm, as well as of the interval of remission, is various and uncertain, even in the same individual. We have seen the paroxysm continue, in different instances, from a few seconds to a quarter of an hour; and, as to the interval, which depends much upon the accidental absence or occurrence of exciting causes, it may vary from a few minutes to many weeks or even months.

The occurrence of palpitation, whether it be constant or in paroxysms, as above described, is always the consequence of some morbid condition of the heart itself or its great vessels, or of the neighbouring organs, or of the general habit; and as the degree of danger, as well as the proper methods of treatment, can only be determined from a clear view of the actual state of disease, in each particular case, it is necessary to inquire into the nature of these morbid conditions, and into the symptoms by which they may be distinguished from each other.

1. The most alarming and dangerous cases of palpitation, are those which are connected with organic derangement of the heart, or of the great vessels arising from it. These derangements occasion palpitation in three ways; *viz.* by increasing the irritability of the heart, by exciting irritation in that organ, or by obstructing the exit of the blood from its ventricles.

The irritability of the heart is increased by *inflammation*, occurring in its substance, or in its investing membrane; the

symptoms, indeed, which belong to inflammation of the heart or of the pericardium, are not easily distinguished; but as we have already described them at length, we need not repeat them here. (See *CARDITIS*.) It will be sufficient to observe, that the degree of fever which accompanies the palpitation, together with a fixed pain in the region of the heart, will afford the principal means of diagnosis of this variety of the disease.

Supposing the irritability of the heart to remain unaltered, an inordinate irritation may be excited by whatever impels the blood into it with unusual force; hence in some individuals palpitation has been produced by violent muscular exertion. It seems to be merely by the irritation, which is excited during the alternate contraction and dilatation of the heart; that partial ossifications in the membranes, or in the substance of the organ, sometimes give rise to palpitations; for such ossifications have been, in other cases, found upon dissection after death, when palpitation had not occurred.

But the most frequent instances of palpitation, arising from disease of the heart, are those which originate from obstruction to the free exit of the blood from the ventricles. The older writers have described the presence of *polypi* in the heart, as a common obstruction of this sort; but the moderns at present are inclined to reject such a notion altogether. It appears to be ascertained, indeed, that these polypi (which are large masses of coagulable lymph, nearly filling up the cavities of the heart, and extending into the neighbouring large vessels) have been invariably formed *after death*, by the slow coagulation of the blood. (See Baillie's *Morbid Anat.* chap. ii.) The valves of the heart are sometimes thickened and opaque, or nearly cartilaginous in their texture, and sometimes partially or entirely converted into bone; so that they are no longer adequate to act as valves, *i. e.* to close the passages. The impediment to the circulation becomes, in such a case, extremely great; for, after the ventricle of the heart has propelled the blood into the artery by its contraction, and again relaxes itself to receive the returning blood from the auricle, it is again partially filled by the reflux of the former, on the contraction of the great artery, through the aperture left by the unclosing valves. Whence a great struggle is occasioned in the heart, to rid itself of the load of accumulating blood. The absence of acute pain, and of fever, a sense of oppression about the heart, and a difficulty of breathing, from the accumulation of blood in the chest, will distinguish the palpitations, arising from diseases of the valves, from those which accompany carditis. The symptoms, however, are not always sufficiently clear to be accurately distinguished in practice.

Every cause of impediment to the complete contraction and evacuation of the heart, is liable to produce palpitation. Hence tumours, pressing upon, and diminishing the calibre of the great arteries, disease in the coats of the arteries themselves, adhesion of the pericardium round the heart, dropsy of the pericardium, aneurism of the heart itself (though this is a very rare disease), or a general enlargement of one or both ventricles. This enlargement of the substance of the heart, indeed, is one of the most common organic causes of palpitation. (See the disease discussed at length, under the article *CARDIOMEGUS*.) The principal means of diagnosis in regard to this variety of palpitation, are to be found in the broad and extended beat under the hand applied to the side of the chest, in the pulsation being felt lower, as between the ninth and tenth ribs, and in a sort of jarring sensation given to the hand by each systole. See Ferriar's *Med. Hist. and Reflect.* vol. i. p. 148.

2. Palpitations of a severe nature are sometimes occasioned by the condition of organs in the vicinity of the heart, in
some

PALPITATION.

some cases irritating it, in others obstructing its action. When the circulation of the blood in the lungs is impeded, it necessarily follows, that the right ventricle of the heart will be oppressed and overcharged; whence palpitations sometimes occur in asthma, in peripneumony, in hydrothorax, and other obstructions in the chest. Disorder, or even mere distention of the stomach, will occasionally give rise to palpitations, especially where there is much irritability of the heart, or any actual disease of that organ or its valves. Thus after a full meal, or from the distention of the stomach by flatulence, this viscus presses the diaphragm upwards, diminishing the cavity of the chest, and therefore obstructing the circulation, as well as compressing the heart; it likewise somewhat compresses the descending aorta in the abdomen, and thus also tends to impede the emptying of the left ventricle of the heart. Such an obstruction, though unperceived in health, is sufficient to produce palpitation, in those in whom the heart is predisposed to it, as above stated. Senac, who has collected several cases illustrative of this fact, remarks also, that distention of the intestines by flatulence, or the accumulation of feces, enlargement of the liver, the presence of worms, and some other abdominal irritations, occasionally give rise to palpitation in a similar manner.

3. The most frequent source of palpitations, next to the actual organic diseases of the heart, is that general condition of the constitution, which gives rise to the various affections, that are called *nervous*. Whence women, who are subject to hysteria, and men labouring under hypochondriasis, are often distressed by most severe paroxysms of palpitation of the heart, inasmuch that the utmost alarm is excited, lest there should be organic disease of that important organ. Indeed, under almost all circumstances of general debility, palpitation is liable to occur, as well as other spasmodic affections; as in the state of chlorosis in young women, during the convalescence from acute diseases, after great hemorrhages, or after long watching, severe study, long continued fatigue, and other causes of exhaustion to the animal frame. It is one of the common torments of extremely sedentary and studious men, and especially of students of medicine, who reduce themselves to a hypochondriacal state, and are then ready to find a whole system of nosology in their own persons.

It is often extremely difficult to pronounce with decision, that palpitations arise from organic diseases of the heart and great vessels, or that they are merely sympathetic of some local irritation, or dependent on a general debilitated nervous condition. In order to form a satisfactory *diagnosis*, it is necessary to examine carefully, not only the seat, nature, and violence of the palpitation, but also the various concomitant symptoms, and to inquire into the previous state of health and diseases of the patient, and to attend to the influence of medicine on the complaint.

In the instances of palpitation, originating from organic derangement, the paroxysms are commonly more violent, and of longer duration,—they occur more frequently, and often without any obvious or adequate cause,—and they are often accompanied with acute pain across the chest, from the sternum to the spine. In the intervals, too, between the paroxysms, the patient is not so entirely free from all beating in the breast, or from some other distressful sensations, such as pain, a sense of stuffing, weight, and oppression; difficulty of breathing, &c. as in the mere sympathetic cases of palpitation. The labouring action of the heart, even in the intervals, is often perceptible to the hand applied over the ribs; and the apex of the organ, instead of being felt between the fifth and sixth ribs, just under the mamma of the left side, is perceived considerably lower, as between the

ninth and tenth ribs. The pertinacity and long duration of this state of disease, with repeated paroxysms, will often afford a strong argument, in conjunction with the other circumstances, for deeming the cause organic. And the previous occurrence of some severe acute disease, especially the rheumatic fever, or acute rheumatism, which is known to leave a frequent disposition to disease of the heart, particularly to enlargement of it, will also tend to modify the judgment in these cases.

It is still more difficult, of course, to distinguish by any symptoms the particular kinds of organic lesion of the heart, than to discriminate these from the other forms of palpitation; and, with a view to practical purposes, it is obviously of little importance; for one organic change is equally inaccessible to the influence of medicine as another. Nevertheless this has been attempted; and an attention to the minute differences of the symptoms, will doubtless, in many cases, enable the experienced practitioner to form shrewd approximations to the truth. For instance, the palpitation will probably be more palpable and obvious to the bystander, when the ventricles, and especially the left ventricle, are enlarged, than when the auricles are dilated or aneurysmatic, in which case, the beating is more obscure and distant under the hand pressing the ribs; and the motions of the pulse and of the heart will be more distinctly synchronous. When the valves are ossified, a hissing or chirruping sound is in some cases distinctly heard, during the violent spasmodic pulsations of the heart. When the heart is much enlarged, the pulsation is less circumscribed and pointed under the hand, applied to the breast, than is natural: in fact, it is broad and diffused; and Dr. Ferriar has remarked, that a certain jarring sensation, which he conceives to be peculiar to this disease of the heart, is felt by the hand under these circumstances. (See *CARDIOG MUS*.) If there is a considerable adhesion of the heart and pericardium with the contiguous parts, Senac is of opinion, that there is rather a tremor than an actual palpitation of the organ. It is not to be overlooked, however, that none of these symptoms are sufficient to establish a certain diagnosis; for it is admitted by the ablest practitioners, that palpitations of the most severe degree, and of different modifications, which had been pronounced the symptoms of organic disease, have, nevertheless, yielded to remedies. See Senac, *Traité de la Structure du Cœur*, liv. iv. chap. xi. § 11; and Ferriar, *loc. cit.* vol. ii.

Although, however, considerable caution is required in deciding that palpitation is the result of organic disease; yet, on the contrary, it may, with more confidence, be pronounced to be independent of such disease, if the paroxysms are slight, and speedily terminate, while the intervals are more completely free from any affection of the chest, and of longer duration. And this conclusion will be farther confirmed, if at the same time other symptoms are present, which indicate a morbid irritability of the habit; such as those of chlorosis, hypochondriasis, hysteria, &c.; or if it be known that the patient has been recently exposed to the operation of the debilitating causes above enumerated. See Headlam, *Diff. Mang. de Palpitatione*, Edin. 1800, p. 23.

According to the decision which is made, as to the source of the disorder, the *prognosis* will be favourable or otherwise. If it be pretty obvious that it is of the latter class, and unconnected with any organic lesion of the heart, it may be expected to be relieved or removed by medicine, according to the age, constitution, and manner of living of the patient, and to the mildness of the disorder of which it is a symptom. But if it appear to be clearly the result of organic disease, a cure cannot be expected, and palliation must be the sole object of the practitioner, and the sole hope of the patient.

PALPITATION.

patient. In this case, the disease will continue, gradually augmenting, for an indefinite period; and as the obstruction to the circulation is increased, other distressing symptoms are apt to supervene, such as asthma, spitting of blood, constant oppression of the respiration, dropsy of the pericardium and of the thorax, and ultimately anasarca; and during the occurrence of any of these affections, or sometimes before any of them have supervened, the patient is not unfrequently cut off by a sudden death, when it was not expected.

In considering the proper *methods of treating* palpitation, two indications are to be kept in view, the one regards the measures to be adopted during the paroxysm; the other, those which are to be pursued during the intervals of remission.

1. *The paroxysm* is to be viewed in the same light as other convulsive actions, from whatever source it may originate; and, like others, it may be relieved by *blood-letting*, and by what are called *antispasmodics*, the choice of which is a matter of some importance. Whether the palpitation be connected with organic lesion or not, if the patient be robust or plethoric,—if he suffer severe pain and a great sense of suffocation,—if the respiration be exceedingly laborious and difficult,—if the pulse beat with a full and hard stroke,—and if there are no obvious marks of great debility or of a dropical tendency,—a free blood-letting from the arm will be safe, and afford speedy relief; nay, it may probably ward off an apoplectic attack, or prevent a rupture of the heart or some great vessel, and thus preserve life. If the palpitation be not of long standing or habitual, and if it be accompanied with the symptoms that belong to carditis, or inflammation of the heart, then copious blood-letting is the principal remedy upon which any dependance can be placed; and it must be repeated, either in the paroxysm, or during the intermission, as those symptoms may require. In the majority of cases, however, the paroxysm will not be of this kind, and the detraction of blood will not only be unnecessary, because useless during the paroxysms, but it will be prejudicial to the subsequent state of the patient.

For whether the disease be organic, and of considerable standing, or sympathetic of the hypochondriacal, hysterical, or nervous temperament, considerable debility is usually present, and the tendency of the disorder is to increase that debility. Whenever, therefore, the patient is obviously not plethoric or robust,—when there is much disposition to syncope, or fainting,—when the pulse is small and weak,—and when the palpitation appears to be the result of strong mental emotions, or to have followed the debilitating circumstances, before enumerated,—then it will be proper to resort to antispasmodics, for the purpose of alleviating and shortening the paroxysm. Of these it will be necessary, in many cases, to take any that may be at hand; as camphor, ammonia, asa fœtida, opium, æther, valerian, castor, &c.; but where the choice can be made, a mixture of æther and the tincture of opium is preferable, as productive of the most speedy and powerful sedative effects.

The patient should not be constrained to assume any particular posture, but should be retained as quietly as possible in that which he instinctively chooses, and which experience satisfies him is the easiest. This is commonly a sitting posture, in which he reclines a little forwards; and sometimes gentle but steady pressure on the ribs of the left side, affords considerable relief.

2. *The treatment required in the interval* will be different, in those cases in which the palpitation results from organic disease, and in those in which it is merely a nervous symptom.

In the organic cases, as we have before observed, palliation is all that medicine and regimen can accomplish; and it

is certain that much alleviation of the sufferings of the patient, and probably that a considerable prolongation of life, is often thus effected. For this purpose two indications are to be kept in view: namely, the one, to avoid every thing that may hurry the circulation of the blood; and the other, to avoid every source of plethora, or turgescence of the vessels.

Both the frequency of the returns of the paroxysms, and the violence of them, may be materially diminished by avoiding all hurry of the circulation. This is effected by a series of minute attentions, in respect to which, although the physician may point them out, the patient "must minister to himself." Constant quietness both of body and mind must be studied; the patient should move carefully and slowly, whenever motion is necessary, and especially should cautiously avoid false steps in walking on uneven ground. He should ascend declivities, as stairs, as little as possible, and therefore sleep on the ground floor of his house. He should shun heated rooms, the influence of strong fires, and of close unventilated apartments. He should avoid entering into the discussion of subjects that are liable to excite any strong emotion, or to ruffle his temper. The regulation of his diet becomes of extreme importance in this point of view; for nothing tends more directly to hurry the circulation, and to produce partial turgescences, than a heating and stimulant regimen. He should, therefore, totally proscribe all spirituous, vinous, and fermented liquors from his table, and should use the lightest and most digestible food, and that in great moderation, avoiding condiments, and a variety of dishes. This regulation of regimen affords, in fact, one of the most effectual means of fulfilling also the second indication, that of avoiding a plethoric condition of the system.

Medicine, however, though inadequate to accomplish these purposes alone, may be made to contribute materially to the same ends, when united with a proper conduct of regimen. The constant and regular evacuation of the bowels, especially by means of saline and other cooling laxatives, conduces both to moderate the activity of the circulation, and to prevent plethora, and cannot be neglected with impunity, where there is organic disease producing palpitation of the heart. If there is actual plethora to any extent, even actual depletion by the lancet may be necessary.

There is another class of medicines which appear to be indicated under these circumstances; namely, such as have the power of directly diminishing the action of the heart and arteries: of these the digitalis is the most effective. This medicine, when combined with the repeated use of saline laxatives, and with the cooling regimen, and system of quietude, above recommended, has, in several cases under the inspection of the writer of this article, appeared to procure a very valuable degree of ease, and freedom from palpitation, when there were obvious signs of organic disease, and to retard the progress of that disease itself.

A very different practice is requisite in the interval of remission, in those cases of palpitation that are merely connected with a morbid irritability of the habit, or with some local irritation. If the palpitation is excited by over-dilatation of the stomach, the meals should be moderate, and the causes of flatulence particularly avoided, while, at the same time, the proper remedies for indigestion should be employed. If the irritation arise from the presence of worms in the intestines, the remedy will be equally obvious. And the use of laxatives, which we have recommended above with another view, will also obviate one source of irritation, which not unfrequently accompanies both indigestion and the hysterical and hypochondriacal habit, namely, an accumulation of feces in the bowels, or habitual constipation.

It is scarcely necessary to dwell upon the treatment required in the intermissions of palpitation, connected with chlorosis, hysteria, hypochondriasis, and other states of debility and irritability of habit; since these diseases have been amply discussed under their respective heads. The general indication is to employ medicines possessed of a tonic power, and to avoid every cause of debility, moral and physical. Preparations of cinchona, gentian, calumba, serpentaria, and other vegetable bitters, the mineral tonics, especially the preparations of iron, the chalybeate waters, &c. and the use of the cold bath, are among the most efficacious means of removing that morbid irritability which gives rise to the spasmodic actions of the heart. Moderate exercise, in the open air, taken in such a way as to avoid any extraordinary hurry of the circulation, which might bring on the paroxysm of palpitation, will be advisable. And every source of anxiety, or other severe emotion of mind, should be avoided as much as possible; by fixing the attention upon interesting and agreeable pursuits, or by travelling.

PALREDYGUR, in *Geography*, a town of Hindoostan, in Palnaud; 16 miles W.S.W. of Timerycotta.

PALSCHAU, in *Biography*, born in Germany, who, before he was thirteen years old, travelled with his father to several parts of Europe, and astonished every auditor by his performance of Sebastian Bach's most difficult harpsichord lessons; and by running most rapid divisions in thirds and sixths, with both hands: eighths he could not reach; and indeed he astonished spectators with his dextrous use of pedals, particularly in our country, where, though there have been pedals in our very large old organs, particularly at St. Paul's, Exeter, and St. Michael's, Cornhill; yet they seem never, or but rarely, to have been used by our organists after Handel's first arrival here, who, we are told, used to go with young Green, then an apprentice, to exercise himself on these *feet* keys in private; intending always, during the reign of his patron the elector (afterwards George I.), to return to Hanover; but young Palschau must have been here very early in our musical life, before we had ever seen or heard of pedals; as, when Mr. Boyce desired us to officiate for him at St. Michael's, Cornhill, we knew not of their existence. (See **PEDALS**.) But soon after we had heard the young German, and seen him use pedals, we heard Miss Robinson, the singer, daughter of Mr. Robinson, the organist of Westminster Abbey, perform wonders on a harpsichord with pedals; which instrument it is probable Palschau's father borrowed of Robinson: for wherever he stopped on the continent, he was sure to find pedals. But after this period, we had been many years surpris'd at hearing nothing further concerning Palschau; and supposed he was either dead, or that some accident had befallen him to stop the progress of his premature talent. And when we went to Germany, one of our first enquiries was after Palschau, when we were told that he was at Riga; but was still regarded as a great player of the Bach school: yet finding on his return home, that his performance became less miraculous every day, as he grew up he acquired great reputation in instructing youths intended for the profession of music, in which he had acquitted himself with an intelligence and integrity so superior to common organists, and masters who take apprentices, in thoroughly grounding his pupils in every branch of the art which they were pursuing, that he was invited to Riga, where he continued to qualify young organists, not only in that city, but from all parts of Germany. He had himself been instructed by Mützel, who was an élève and imitator of C. P. Emanuel Bach. He compos'd but little, except two harpsichord concertos, and some songs. But

we have heard since that his fame became so extensive as to produce an invitation to Petersburg, where his good taste in playing, and manner of teaching, pleas'd so much, that he was appointed court-master by the empress Catharine, and his salary in that office, and the many scholars he had in great families, made him so easy in his circumstances, that he would undertake no more boys on the chance of their becoming great musicians, unless, on examining their hands, he found them well formed by nature; and that every finger on both hands were equally strong. He likewise examined their heads, by putting questions to them, which, to answer, required intellect. He then assign'd, for practice to them, as a first lesson, one of the most complicated and difficult compositions for keyed instruments that he could find. We are to suppose, before these students apply'd to him, they were well acquainted with the first elements of music; as the gamut, time-table, clefs, flats, sharps, and the usual characters for graces, &c. He inform'd these young candidates for his institutes, that he would set no limits to the time they should take in accomplishing this task: as, if they only learn'd a bar in a week, they must come to the end of their labour at last.

We were furnish'd with the character and singularities of this musician, by the Rev. Mr. Smernove, of the Greek church (the chaplain of count Worantow) and his brother, John Smernove, a fine performer on the violin, and private secretary to the count, when ambassador from Russia.

PALSCHOV, in *Geography*, a town of Prussia, in the province of Pomerelia; 11 miles N.W. of Marienburg.

PALSGRAVE, a term used among the Germans, of the same import with *palatine*.

It is compounded of the Latin *palatium*, and the Dutch *grave*, *governor*, *g. d.* governor, or superintendent of a prince's palace.

PALSY, in *Medicine*, a corruption of *paralyfy*, from *παρλυσις*, *paralysis*, *laxatio*, *resolutio* or, as the Latins wrote, *nerovorum resolutio*, (relaxation of the muscles,) signifies a loss of the power of voluntary motion.

The appellation of *palsy* is, therefore, not applicable to those cases of impaired mobility of muscular parts, which arise from mechanical stiffness, or from inflammation; but only to those which are occasioned by an inherent imbecility in the muscles themselves, or rather in the nerves with which they are furnish'd, and through the medium of which the moving power is communicated from the brain.

It will not be necessary, in this place, to enter into any detail respecting the nature and functions of the nervous system in the animal body, as the structure and properties of that system have been amply delineated under its proper head. (See **NERVOUS System**.) It is sufficient for our purpose to know, that a multitude of accidents and experiments have demonstrat'd the dependence of *sensation* and *voluntary motion*, in every part of the body, upon the uninterrupted communication of nerves between that part and the brain respectively; and that the interruption of this communication, either by the division of the trunks of the nerves, or of the great nervous mass in the canal of the spine, (incorrectly call'd the *spinal marrow*,) or by pressure on the same; or, lastly, by pressure or other mechanical injury to the brain itself,—is invariably followed by a loss of one or both these faculties in the parts beyond such injury.

Hence the term *paralysis* comprehends a great variety of sensitive and muscular incapacity, to which various appellations have been given, according to the general or partial loss of power, or to the nature of the sensation so impaired. Where the whole power of motion and faculty of sensation

PALSY.

are abolished, the term *palsy* is, indeed, seldom employed, but the disorder is called *apoplexy*. When one-half of the body, longitudinally, is paralyzed, *i. e.* when the leg, arm, &c. of one side only lose their powers, while those of the other remain unimpaired, (which is the most common form of palsy,) the disease is termed *hemiplegia*, or *hemiplexia*: and when one-half of the body is palsied *transversely*, for example, when both the lower extremities are palsied, while the arms and upper parts retain their power, the malady is called *paraplegia*, or *paraplexia*. Some writers have appropriated the term *parefis* to the palsy of individual parts or muscles, as of the arms or legs, of the tongue, eye-lids, bladder, &c. Originally, however, these appellations appear to have been employed as general terms, without much discrimination. Again, a paralytic condition of the different organs of sense has been designated by corresponding appellations. Thus the loss of feeling, or of the sense of touch, has been called *anæsthesia*, that of vision, *amaurosis*, that of smell, *anosmia*, that of taste, *agheusia*, that of hearing, *dyscæa*, &c. These affections will be found described under their proper heads; and, in this place, our attention will be directed to the more general forms of palsy, especially to the *hemiplegia* and *paraplegia*, and to those partial kinds, which are the result of particular agents, such as of the poison of lead, mercury, &c.

I. *Of the Hemiplegia.*—The palsy, which is most frequently seen, and which consists in the loss or diminution of the power of motion of one side of the body, is sometimes the consequence of an attack of apoplexy, where that has not proved fatal; but it more commonly occurs instantaneously, and without any actual apoplectic attack. In the latter case, however, the disease differs from the former only in the degree of injury which has taken place in the brain, the pressure upon that organ being more partial than in apoplexy.

The *symptoms of hemiplegia* are distinct and obvious, and scarcely liable to be confounded with those of any other disease. The most manifest symptom is the want of command over the limbs of the side affected, which either remain totally immovable by the will of the patient, or are possessed of so little power, that the arm hangs dangling by the side, and the leg is dragged along the ground, rather than elevated in attempting to walk, and vibrates from want of firmness, whenever the foot is planted on the ground. At the same time, the limbs are perfectly flexible by any external impulse, to which they offer no resistance. As the muscles of one side of the head are also paralyzed, the features, especially the mouth, are commonly drawn away, giving a distorted appearance to the countenance; for, as the paralyzed muscles offer no resistance, so the constant tendency to contraction in the healthy muscles of the opposite side necessarily operates in drawing the whole towards themselves. The face is contracted, therefore, not on the palsied, but on the sound side. The same palsied condition exists also in one-half of the tongue, which, if it be attempted to be protruded, is shewn in a curved state, the point always turning towards the angle of the mouth on the paralytic side. This palsied state of the tongue and lips, and other organs subservient to the voice, is necessarily the cause of indistinct articulation; so that various degrees of defect of speech accompany *hemiplegia*. From the morbid state of the brain, which gives rise to palsy, the functions of the mind are frequently more or less injured; the memory especially is liable to be impaired, and, in many cases, every faculty is so debilitated, that a considerable degree of fatuity or childish imbecility is the consequence. Indeed, there are perhaps few instances, in which the intellectual functions escape entirely unimpaired from an attack of hemiplegia: so that, where the stroke of

palsy has been severe, few persons are left in a condition fitted for the active and important duties of life subsequently.

Some other phenomena accompany the paralytic state, which vary in different cases, and of which our knowledge of the nature of the nervous system and its functions is insufficient to afford an explanation. Although the nerves are unquestionably the medium, both of *motion* and *sensation*; yet these two faculties are seldom injured in the same proportion. In the majority of cases of hemiplegia, the sensation of the palsied limbs is unimpaired; in a few instances, it is considerably diminished, *i. e.* a degree of numbness and torpor exists throughout; whilst in others, the sensation of the affected parts is entirely abolished, *anæsthesia* being combined with the *paralysis*. But, on the other hand, many cases of a total abolition of the power of sensation, in parts which retained the full power of motion, are recorded. Dr. Gregory used to mention an instance in his lectures at Edinburgh, in which there was a perfect *anæsthesia* on one side of the body, and a *hemiplegia* on the other; *i. e.* the nerves, on one side, ceased to be the instruments of sensation, while, on the other, they ceased to be the instruments of motion. Afterwards the hemiplegia attacked the other side; so that there was palsy without feeling on one side, and palsy with the feeling perfect on the other: the patient recovered; and the side, in which both faculties were lost, was the first to regain its powers.

In some cases of palsy, too, the circulation is materially affected, and in others not. Thus, sometimes the pulse in the affected side is slower than in the other; sometimes it is not to be felt, and the temperature of the limb is much diminished. In some cases the substance of the muscles is partly absorbed, and the palsied limbs waste; and occasionally anasarca effusions take place in them; but in others no such changes occur. Sometimes the sensations of the palsied parts are depraved, such as feelings of prickling and tingling, or actual pain; and sometimes there is numbness, with a sense of weight and load, as if from an extraneous body. A patient under this state of feeling exclaimed, "will nobody own that arm?" an exclamation sufficiently characteristic of the helpless condition of the limb.

Although the attack of palsy is sudden, yet, in the majority of cases, various pre-monitory symptoms occur, sometimes for a long period before the attack, which indicate the approaches of the disease. These symptoms are the result of an increasing determination of blood to the head, and consist of head-ache, giddiness, a sense of weight, and distention in the head; dimness of sight, or the appearance of motes floating before the eyes (called *muscæ volitantes*); sometimes a degree of squinting, and even of double vision; noise in the ears; occasional stammering in the speech; transitory numbness or loss of motion in the extremities; failure of the memory; drowsiness, especially after eating, but disturbed sleep; flushing of the face and neck; throbbing of the temporal arteries; and bleeding from the nose. Some one or more of these signs frequently precede the actual change in the state of the brain, which gives rise to paralysis, and an attention to them is therefore of great practical importance. They will, however, more certainly lead to an apprehension of an impending apoplexy or palsy, when they occur in persons who are constitutionally predisposed to these diseases.

The *predisposition* to paralytic affections is connected with a particular habit of body, which is frequently hereditary, and is characterized by a large head, and a short neck, especially in persons with dark eyes and hair, and by a corpulent habit. The large head implies a considerable proportion of blood circulating in the brain, and the short neck,

that

PALSY.

that it is carried thither with greater impetus. The corpulent state both gives and indicates the predisposition; for an over-proportion of fat generally implies an over-proportion of blood, as both arise from the same causes. A great quantity of fat, too, presses upon the organs and vessels of the body, and necessarily tends to produce an accumulation in the parts where no fat is secreted, as in the brain. A certain advanced age also contributes to the predisposition to palsy, as a degree of venous plethora is then often produced; so that palsy seldom takes place before the age of forty. The same effect is produced by an indolent and sedentary mode of life, by a full diet, and especially by a habit of intoxication, which produces a great determination of blood to the head. But any habitual excess in the use of wine and malt liquors, although inconsiderable, and not occasioning intoxication, will have a similar effect. A plethora, and therefore a predisposition to palsy, is also induced by the stoppage of customary discharges, such as bleeding at the nose, a copious hæmorrhoidal or catamenial flux, the drying of habitual ulcers, &c.

Where this predisposition exists, various circumstances may operate as the *exciting causes*, and bring on the paralytic seizure; and these causes produce that effect, either by determining an extraordinary quantity of blood into the brain, or by preventing a free return of it from thence; whence a *morbid degree of pressure* is occasioned in that important organ, either from simple congestion and over-distention of the vessels, or from congestion, followed by an effusion of serum, or by a rupture of vessels and an extravasation of blood. Now, an unusual flow of blood to the head is occasioned by every stimulus to the general circulation; whence *violent exercise*, by which the pulsations of the heart are quickened and increased in force; great external *beat*, which produces a similar effect; paroxysms of *anger, intoxication*, or even a more moderate excitement by strong liquors, have, in different instances, produced the paralytic attack. On the other hand, the blood is impeded in its exit from the head in various ways: thus *slooping*, or any other situation in which the head is kept in a depending position, and in which therefore the gravity of the blood increases the afflux of it by the arteries, and opposes the return of it by the veins; *tight ligatures* round the neck, which compress the veins more strongly than the arteries; *impeded respiration*, or a full and long continued *inspiration*, as in violent straining, or a *long expiration*, as in coughing, laughing, &c., which impede the circulation through the lungs for a time, and therefore interrupt the free return of the venous blood from the head; *over-distention of the stomach* by a full meal, which compresses the great descending artery, and also prevents the descent of the diaphragm, and therefore impedes the pulmonary circulation; all these circumstances have occasionally given rise to apoplectic and paralytic seizures. Indeed the manifest redness and flushing of the face and eyes, and the general turgescence of the countenance, occasioned by slooping, by tight neckcloths, by long fits of coughing and laughing, by intoxication, by violent muscular exertions, and by a full hearty meal, sufficiently demonstrate the determination of blood to the head, which they excite. With respect to the influence of a full meal, the common reports of the newspapers afford abundant evidence; since nothing is more frequent than the accounts of sudden death, just after persons had eaten a hearty dinner or supper, and enjoyed the company of their friends.

This view of the nature of the causes of palsy, is completely confirmed by the examination of the state of the brain, by dissection, where the disease has terminated fatally; appearances of congestion and accumulation of blood in the

vessels of the brain, or of effusion of serum, or of actual rupture of the vessels and extravasation of blood, have always been observed, where the attack was sudden; and in cases of the gradual supervention of palsy, some morbid growth, producing a slowly increasing pressure, which gradually disturbed the functions of the sensorium, has been commonly found. So that, in all these cases, the obvious cause of the palsy has been the interrupted communication of the nervous influence, whatever that may be, from the brain to the parts which had become paralytic.

The palsy and the apoplexy, which are thus produced, in connection with an over-distended condition of the vessels of the brain, and with a plethoric habit, a short neck and large head, have had the epithet of *sanguineous* given to them; because it has occasionally been observed, that the same diseases have occurred in habits of a very different character. For example, persons of tall and slender form, of spare habit, with small heads and long necks, and pallid complexion, in whom no external marks of plethora, or of determination of blood to the head, were visible, have nevertheless been now and then seized with palsy, or died from a sudden apoplectic stroke. It has been supposed, that these diseases in such persons, originated from pressure produced in the brain by an effusion of serum, which is occasioned, not by an over-distention of the blood-vessels, but by a state of relaxation in the exhalant artery, the same as in other cases of a *dropical diathesis*, or by an over-proportion of the watery part of the blood, which is therefore ready to run off by the exhalants. Whence, in contra-distinction from the ordinary forms of these diseases, the epithet, *serous*, has been applied to this variety. (See Cullen, First Lines, par. 1112.) Dissection, however, does not seem to have confirmed this theoretical division of the forms of the disease; for, in several cases of fatal apoplexy, which occurred in thin and spare habits, the same congestions and ruptures have been found to have taken place, as in those patients, whose large heads and plethoric condition implied a fullness of the blood-vessels. In fact, medical observation teaches us, in numerous other instances, that local determinations and partial congestions of blood are liable to occur in persons very far removed from a plethoric condition; and that a paucity of the circulating fluids is no infallible security against local fullness. In our practical considerations, therefore, the notion of *serous apoplexy* or palsy should perhaps be altogether discarded.

It is a curious fact, which has been ascertained by anatomical investigation, that in most of the instances of hemiplegia, the cause of derangement in the brain is found on the side *opposite* to the paralytic affection. A few cases have occurred, in which the morbid cause is said to have been on the same side as the palsy; but this is certainly an exception to the general fact, and therefore the matter may still be considered as liable to doubt. Nevertheless anatomy has not taught us a satisfactory explanation of the phenomenon, that the injury of the brain and the palsy of the body occur on opposite sides. Anatomists have supposed a certain decussation or crossing of fibres from one hemisphere of the brain to the other; but there has been no very satisfactory demonstration as to this point. M. M. Gall and Spurzheim, the most accurate investigators of the structure of the brain, maintain that there is no decussation, except for the space of four or five lines at the lower extremity of the medulla oblongata, and they therefore deny that injury to one side of the brain (with exception of injury to the anterior *corpora pyramidalia*) ever affects the opposite side of the body. The facts, however, are perhaps too numerous to be set aside by the mere hypothesis, suggested by a difficult examination of a very obscure structure. See NERVOUS System.

Neither

PALSY.

Neither has any anatomical investigation afforded the means of explaining the different phenomena above alluded to, respecting the various and disproportionate affections of the *sensation* and power of *motion*, in parts supplied by the same nerves. For a clear and copious detail of the researches and opinions of anatomists and pathologists on these topics, we shall refer the reader to a paper of Dr. Yelloly's, in the *Medico-Chirurg. Transactions*, vol. i. p. 181.

Independently of mechanical pressure produced in the manner above described, some other causes occasionally injure the functions of the brain, and render it incapable of diffusing the nervous power to the limbs, and thus produce a species of palsy. Certain poisonous substances have that effect, such as lead, and perhaps mercury, and some of the narcotic vegetables, such as the belladonna. A severe and continued impression of cold, long continued grief, great terror, and other depressing passions, occasionally also give rise to paralytic affections, by their direct influence upon the state of the brain.

The *prognosis* is generally unfavourable in *hemiplegia*, more especially when the patient is in advanced life, or debilitated in constitution, or has been in habits of intemperance. For under such circumstances, the system seldom recovers its powers, and the patient remains enervated both in mind and body, and generally incapable of the ordinary business of life. If, as the disease continues, the paralysed limbs gradually lose their sense of feeling, or if they are affected with coldness, and the flesh wastes, the prospect is most unfavourable. But, if there is a frequent prickling sensation, or even some degree of pain, in the parts; if they are occasionally affected with flushings of heat, or with spasmodic twitchings; or if rheumatic or inflammatory swelling take place in them, these appearances are to be deemed favourable, inasmuch as they imply a less complete interruption of the nervous power, or its returning influence.

The *treatment of hemiplegia* will necessarily be somewhat different in different instances, according to the age and constitution of the patient, and to the obvious exciting cause of the disease. Before we state the general indications of cure, however, and the methods of fulfilling them, it will be proper to observe that the *prophylactic* treatment is often the most essentially useful. It too often happens, that, when the attack has taken place, some irremediable injury has been inflicted on the delicate texture of the brain, which, had the warning symptoms, which we have enumerated above, been attended to and removed, might have been altogether averted.

As a plethora of the vessels, either general or topical, is indicated by those premonitory symptoms; so the means of obviating that plethora are equally obvious, and within our power. Whenever, therefore, we observe these symptoms in persons, whose form and habit evince a predisposition to the disease, and more especially in those who have suffered a previous attack, every means should be resorted to, which diet, regimen, and an evacuant plan of medicine, can afford, to reduce the plethoric condition. The diet should now be low, consisting of whey, butter-milk, fruits, and farinaceous food, animal matters being discarded, or a little plain meat taken once every other day, and all fermented liquors totally abstained from. Even filling and distending the stomach frequently with mere vegetable matters ought to be avoided, for the reasons above explained. If the symptoms of oppression about the head are very considerable and menacing, it may be advisable to take some blood from the vessels of the head or neck, either by the lancet, by leeches, or by cupping; and at the same time the bowels should be well evacuated by cathartic medicines.

If, however, the previous symptoms have been neglected, and the attack of hemiplegia have actually come on, the *first* indication that presents itself, will be to remove or diminish the cause of compression, which may exist in the brain, whether it may be mere vascular turgescence, the extravasation of blood, effusion of serum, &c.; and the *second* indication will be gradually to excite the torpid portion of the brain and nerves to a sensible and active state. How very little power we possess, however, to accomplish either of these purposes, except in the case of mere vascular congestion, medical experience too clearly demonstrates.

Whatever may be the nature of the compression in the brain, it cannot be doubted, that a diminution of the turgescence of the vessels will tend to diminish it, by removing some portion of the bulk of the fluids in the general mass of the viscus. If the compression arise from mere congestion, it may be entirely removed by such a measure; and if it arise from actual rupture and extravasation, or from a serous effusion the result of plethora, the abstraction of some portion of the circulating fluids will tend to arrest the progress of the extravasation or effusion, and therefore at least prevent an increase of the evil. Under all circumstances, therefore, the local detraction of blood seems to be advisable at the onset of *hemiplegia*. The quantity of blood to be taken away, as well as the mode of taking it, will be determined by the severity of the attack, and by the strength and plethoric condition of the patient. If the patient be extremely full and florid, and has not passed the middle age, a free *bleeding* from the *temporal artery*, or the *jugular vein*, may be preferable: but, even in the pale and thin habit of body, *cupping* the neck or temples, or the application of *leeches* to those parts, should be resorted to. In the full and florid habits, general blood-letting from the arm is often employed; but the same general depletion may be accomplished by the section of the temporal or jugular vessels, while at the same time a more effectual depletion of the vessels of the brain will be produced. And in order that the local effect may be still more complete, it is desirable to make the evacuation from the side of the head opposite to the hemiplegic affection.

At the same time, other means of diminishing the impetus of the circulation in the head must be resorted to, as auxiliaries. The bowels should be emptied by active *cathartics*, by which a considerable depletion of the vessels, and a determination of the fluids downwards, are produced. Some practitioners also recommend emetics; but the objection of Dr. Cullen against these medicines, that the action of vomiting might impel the blood with too much violence into the vessels of the head, seems to be well founded, and they are seldom now employed. *Blisters* applied to the shaven scalp, or to the nape of the neck, by the counter-irritation which they occasion externally, tend to diminish the internal action of the vessels.

It is a practice, but too generally adopted by routine-practitioners, to begin immediately with the exhibition of strong stimulants, upon the superficial inference, it should seem, of a torpor of the nervous power. But if they were to penetrate a little below the surface of things, it would be evident that this torpor of the nerves depends entirely upon an oppressed state of their origin, the brain, in consequence of an over-action and turgescence of its vessels; and, therefore, that every measure, which tends to augment vascular action, must necessarily be a source of aggravation to the disease. Upon the plainest principles, the very opposite object is to be pursued; and until the symptoms of plethora, and the active state of the disease be subdued, the measures, which we have recommended as proper with a preventive view, should still be adhered to.

The

PALSY.

The second indication, therefore, which is "gradually to restore the torpid portion of the brain and nerves to a sensible and active state," can only be followed, after the hemiplegia has subsisted for some time, and when the symptoms, indicating a considerable compression of the origin of the nerves, are removed. But even under these circumstances, the use of stimulants would appear to be of very ambiguous advantage. For it may be doubted, whether any paralytic affection, originally produced by compression of the brain, would continue after the compression was removed, *i. e.* whether the very existence of the hemiplegia does not imply the continuance of a compressing cause, or at least of some organic injury, which it had inflicted and left behind. And at all events, the multitude of patients, who have in vain swallowed, for a long period of time, all manner of volatile, fetid, and spirituous stimulants, who have submitted to electricity and friction, and stimulant liniments, and warm bathing, and who have nevertheless neither obtained a recovery of the power of their limbs, nor even prevented subsequent attacks, do not bear any very favourable testimony to the efficacy of these expedients; while, on the contrary, the small proportion of persons, who do recover the full use of their hemiplegic limbs, may justly ascribe their recovery to the slightness of the original attack, to the absence of effusion, extravasation, or any other organic mischief, and to the self-adjusting powers of the constitution, as soon as the cause of disease is removed. In some cases, indeed, it may be supposed that, even where actual effusion or extravasation had taken place, without materially injuring the texture of the brain, the fluids may be ultimately removed by absorption, and the brain therefore be restored to health; but, even in such cases, the beneficial aid of stimulants is more than problematical. In a word, it appears, that stimulants are perhaps never advisable in true hemiplegia; and that the benefit of these remedies is limited to those species of general palsy which arise from the influence of cold or narcotic poisons on the brain and nerves, or to those *local* varieties of palsy which seem to depend upon disease affecting the branches and extremities of the nerves, while the brain remains uninjured; of which we shall have occasion to speak presently.

For the purpose, therefore, of aiding recovery from an attack of hemiplegia, the principal indication will be, to avoid every species of intemperance; to restrict the diet to light and cooling articles, and to take these with great moderation; to employ regular but always gentle exercise, avoiding every extraordinary hurry of the circulation; to preserve a regular, and rather free, state of the bowels; and to manage the clothing, so as to preserve a regular state of the cutaneous exhalation, and to avoid the impressions of vicissitudes of heat and cold. In a word, the object will be to free the constitution from all embarrassment, in which condition it will be the best enabled to resume its healthy actions. We may liberate and assist, but we cannot command the powers of the *vis medicatrix nature*.

It may be observed, however, that where the attack has been slight, and the tendency to recovery obvious, the return of power in the paralyzed muscles seems to be considerably accelerated by a constant exertion of them, or at least by constant attempts at exertion by directing the volition to them. The advantages of this voluntary exertion are commonly obvious in the more speedy and complete recovery of the motion of the leg, when compared to that of the arm, in persons who have suffered hemiplegia: a circumstance to be ascribed solely to the necessity of *using* the leg in moving from place to place, while the arm is too commonly hung in a sling, and no attempt is made to employ it.

II. *Of the Paraplegia, or Palsy of the lower Extremities.*— Without referring to the original acceptance of the term *paraplegia*, respecting which there has been some difference of opinion, and no very determinate definition (see Van Swieten, Comment. Aph. 1018.); we take it in its modern sense. A palsy of the lower extremities may perhaps sometimes arise from injury or disease in some part of the brain itself; but of this the evidence appears to be imperfect; and at all events the occurrence is rare. The ordinary instances of this palsy obviously originate from pressure on some part of the *vertebral nerve*, or spinal marrow, below which the palsy shews itself, while the parts supplied with nerves, that branch off above the seat of the pressure, continue to possess their power of motion unimpaired.

The *paraplegia* may occur at all ages, and in either sex, and is always productive of much distress: for if the patient is a child, it becomes an object of constant and unavailing anxiety to its parents; and if an adult, he is rendered perfectly helpless to himself, and useless to all others, which of all possible states is surely the worst.

When this palsy attacks an infant of only a year or two old, the true cause of it is seldom discovered, until some time after the effect has taken place, at least by parents and nurses, who know not where to look for it. The child is said to be uncommonly backward in the use of his legs, or it is thought to have received some hurt in its birth. When it affects a child, who is old enough to have already walked, and who has been able to walk, the loss of the use of the legs is gradual, though not very slow. He at first complains of being very soon tired, is languid, listless, and unwilling to move much: or at all briskly: in a short time after this he may be observed frequently to trip, and stumble, although there be no impediment in his way; and whenever he attempts to move briskly, he finds that his legs involuntarily cross each other, by which he is frequently thrown down, and that without stumbling; upon endeavouring to stand still and erect, without support, even for a few minutes, his knees give way and bend forward. When the distemper is a little farther advanced, it will be found that he cannot, without much difficulty and deliberation, direct either of his feet precisely to any exact point; and very soon after this, both legs and thighs lose a good deal of their natural sensibility, and become perfectly useless for all the purposes of locomotion.

When the disease occurs in an adult person, its progress is much the same but rather quicker. He complains also, in the early part of its course, of a sense of numbness in the affected limbs, with transitory tremblings and twitchings, and sometimes of rigors: and he finds, as the bladder and lower portion of the bowels are included in the disease, that the stools pass off unconsciously, and the urine flows without his consent, at the same time that he has a difficulty of emptying the bladder. Ultimately the legs become rigid, and the knees and ankles stiff, and the feet extended, so that they cannot be placed flat on the ground. This last circumstance is likewise observed in children.

When the back is examined, some prominence or curvature of the spine is always found. This curvature varies in situation, extent, and degree, being in the neck or back, and sometimes, though very rarely, in the upper part of the loins; sometimes comprehending two vertebræ only, sometimes three or more, by which the extent of the cure becomes necessarily more or less; but whatever may be the number of the vertebræ concerned, or whatever the degree or extent of the curvature, the lower limbs only feel the effect, the arms never being affected.

The effect is also different in different subjects: some are rendered

PALSY.

rendered totally and absolutely incapable of walking in any manner, or with any help, and that very early in the course of the distemper; others can make a shift to move about with the help of crutches, or by grasping their own thighs with their hands; some can sit in an erect posture, in a chair, without much trouble or fatigue, which others are incapable of, at least for any length of time: some have such a degree of motion in their legs and thighs, as to enable them to turn and move for their own convenience in bed; others have not that benefit, and are obliged to lie till moved by another.

The general health of the patient does not seem at first to be materially, if at all, affected; but when the disease has continued some time, and the curvature is much increased, many inconveniences and complaints come on; such as difficulty in breathing, indigestion, pain, and what they call a tightness at the stomach, obstinate constipations, purgings, the involuntary flux of urine and feces before mentioned, together with what are called nervous complaints. Some of these are occasioned by the alterations made in the cavity of the thorax, and others seem to arise from impressions on the abdominal viscera, by the intrusions of the ribs, as the spine is distorted. The confinement and inability for taking exercise, will account for the other symptoms, that are not the direct result of the paralysis.

The disease is commonly ascribed to some injury, such as a blow, fall, or violent strain, which had affected the spine; and probably this is actually the origin of it in many instances. But there is no doubt, that the spine and its ligaments often become diseased, so as to produce paraplegia, independently of such violence. For it is not the mere distortion or curvature of the spine which gives rise to the palsy; since the most extensive crookedness often occurs where no paralysis exists; but actual pressure upon the vertebral nerve, by the concomitant disease of the spine.

This morbid change in the structure of the spine has been described by Mr. Pott as follows. By many dissections he ascertained, that in infants, in young children, and in those who had been afflicted with the disorder but a short space of time, the ligaments connecting the vertebræ of the curved part were altered from their natural state, being somewhat thickened and relaxed, and the bodies of these bones were palpably enlarged in their texture, just as in the joints of rickety children. In those who had laboured for a long time under the malady, and in whom the symptoms were consequently aggravated, whatever might be their age, the ligaments were still more thickened, relaxed, and altered, the bodies of the bones more enlarged and spread, and more inclining to become carious, and the cartilages between the bodies of the vertebræ much compressed and lessened in size: and in all those who had so long laboured under the disease as to be destroyed by it, or by its consequences, the corpora vertebrarum were completely carious, the intervening cartilages totally destroyed, and a quantity of sanies lodged between the rotten bones and the membrane investing the spinal marrow.

The cure of paraplegia was seldom effected till the proper treatment was devised by Mr. Pott. While the curvature of the spine remained undiscovered or unattended to, the disease was generally considered as nervous, and medicines so called were most frequently prescribed, together with warm liniments, embrocations, and blisters, to the parts affected; and when the true cause was known, recourse was always had to steel stays, the swing, the screw-chair, and other pieces of machinery, in order to restore the spine to its true and natural figure. But these expedients did not serve any real or permanent good purpose: the patients usu-

ally became unhealthy, and, after languishing for some time under a variety of complaints, died in an exhausted and emaciated state; or, which was still worse, dragged on a miserable existence, confined to a great chair, or bed, totally deprived of the power of moving.

The sagacious mind of that eminent surgeon, Mr. Pott, partly from a consideration of the diseased state of the ligaments and bones, which precedes and occasions the curvature, and partly on the suggestion of a learned physician, Dr. Cameron, of Worcester, who, in consequence of an observation of Hippocrates, that a paraplegia had been cured by an abscess in the back, had imitated that process with advantage; devised the plan of instituting a free discharge, by means of a large issue, from both sides of the spine. Experience confirmed the utility of this practice, and many examples of the complete restoration of strength and motion, in these deplorable cases, have been subsequently recorded. (See "Select Cases of the Disorder, commonly termed, the Paralysis of the Lower Extremities," by John Jebb, M.D. &c. 1782.) Mr. Pott's method of practice is related, in his own tract on the subject, in these words.

"The remedy for this most dreadful disease, consists merely in procuring a large discharge of matter, by suppuration, from underneath the membrana adiposa on each side of the curvature, and in maintaining such discharge, until the patient shall have perfectly recovered the use of his legs. To accomplish this purpose, I have made use of different means, such as setons, issues made by incision, and issues made by caustic; and although there be no very material difference, I do upon the whole prefer the last. A seton is a painful and a nasty thing; beside which it frequently wears through the skin, before the end for which it was made can be accomplished. Issues made by incision, if they be large enough for the intended purpose, are apt to become inflamed, and to be very troublesome before they come to suppuration. But openings made by caustic are not in general liable to any of these inconveniences, at least not so frequently, nor in the same degree; they are neither so troublesome to make nor to maintain. I make the eschars about this size and shape," [here he inserts an ellipsis, of an area equal to that of a shilling,] on each side the curve, taking care to leave a sufficient portion of skin between them. In a few days, when the eschar begins to loosen and separate, I cut out all the middle, and put into each a large kidney-bean. When the bottoms of the sores are become clean by suppuration, I sprinkle, every third or fourth day, a small quantity of finely powdered cantharides on them, by which the sores are prevented from contracting, the discharge is increased, and possibly other benefit obtained. The issues I keep open till the cure is complete, that is, until the patient recovers perfectly the use of his legs, or even for some time longer; and I should think that it would be more prudent to heal only one of them first, keeping the other open for some time, that is, not only until the patient can walk, but until he can walk firmly, briskly, and without the assistance of a stick; until he can stand quite upright, and has recovered all the weight, which the habit, or rather the necessity of stooping, occasioned by the distemper, had made him lose."

Although this remedy is sufficient for the cure of the disease, Mr. Pott admits, that there is no reason why every assitant means should not be applied at the same time, in order to expedite it; such as cinchona, cold bathing, frictions, &c. See "Remarks on that kind of Palsy of the Lower Limbs, which is frequently found to accompany a Curvature of the Spine, &c." By Percivall Pott, surgeon to St. Barthol. Hosp. 1779.

III. Of Paralysis, or local Palsy.—Under this head we shall in-

PALSY.

include all the forms of paralysis which are partial, and seem rather to depend upon a disordered condition of the nervous cords, near their extremities, than upon any injury done to the common sensorium, or to the great trunk of the spinal nerve. The partial palsies of this kind are chiefly those which are connected with long-continued rheumatic inflammation, or with the long application of cold, or lastly, with the operation of certain mineral poisons, especially lead and mercury.

After a limb has been for some time the seat of inveterate rheumatism, especially in debilitated habits, it sometimes becomes torpid, and benumbed as it were, losing its power of motion, and commonly some degree of its sensibility. A similar condition is more speedily produced by the direct application of cold to the parts; as, for example, in the legs and feet of persons who work with these parts in water. The extremities of the nerves appear to be no longer capable of receiving and conveying the nervous power from the brain, while the latter shews no symptom of any disease. The *poison of lead*, by whatever means it is introduced into the system, produces a species of palsy peculiar to itself: its first effect is the production of a severe colic, which from its being most frequently seen in painters, has been called the *painter's colic*; and it has received also several other appellations, from certain districts in which it has been prevalent, as the *Devonshire colic*, *colic of Poitou*, &c. (See COLICA PICTORUM.) After one or more attacks of this colic, the patient perceives that one of his hands grows weak, and at length he finds himself altogether unable to extend either the hand or the fingers, which hang down (nearly at a right angle to the arm, when it is held out horizontally,) torpid and moveless, except from external force. As this commonly succeeds the attacks of colic, it may be probably connected with irritation in the intestinal canal, which appears at times to produce other forms of partial palsy. The palsy from the influence of *mercury* is also of a peculiar nature; it seems indeed to be rather an extreme debility of the muscles of the limbs, combined with tremors, than an absolute paralysis. See the accounts given of this disease by Ramazzini de Morbis Artificum; and by De Haen, in his Ratio Medend. See also some observations of Dr. Bateman, in the Edinburgh Med. and Surg. Journal for 1812.

It is to these varieties of palsy, in which there is no plethora, congestion, or pressure upon the brain, that the employment of *stimulant* remedies alone is properly applicable, and that in fact any benefit is to be expected from them. For if a slight attack of hemiplegia is gradually removed during their exhibition, all that can be said is, that the stimulants did not prevent recovery; for assuredly the recovery would take place, the pressure of the brain having ceased to exist, if no stimulants were employed; and where, as happens in the majority of cases, some pressure still remains, no benefit can possibly be derived from stimulants; but the risk of injury is manifest. But in the local palsies just described, the local torpor of the nerves may be often effectually removed by the use of stimulant remedies.

In the palsy that is occasioned by protracted rheumatism, or by cold, recovery has frequently followed a perseverance in the use of the warm bath, of repeated and continued friction with the flesh-brush, or with various stimulating oils and liniments, of which camphor, turpentine, and the acrid gums, together with alcohol, constitute the principal ingredients. Internally, also, stimulant medicines of a similar nature have been at the same time administered, with a view to aid these effects; especially the ammoniacal salts, or tinctures of the stimulant gums in alcohol, and medicines which

have been supposed to possess peculiar powers of exciting the nervous system, such as the arnica, the rhus toxicodendron, &c. Electricity has also been extensively applied to paralytic limbs under these circumstances, and it is probable, both from its obvious influence in exciting spasmodic twitches in the muscles, and from the number of successful instances of its application which have been recorded, that it has been of material benefit. There is, however, great room for self-deception in these cases, as we have shewn at length under the article IMAGINATION, and the metallic tractors and animal magnetizers can adduce ample testimony of their powers in the same sort of disease. For our own part, we have seen so little obvious advantage derived from electricity in *any disease*, as to have nearly relinquished the employment of it; and the use of galvanism, for the same purposes, seems to be sinking also into discredit.

We have mentioned, among other stimulants that are really successful in the cure of these species of local palsy, the *warm-bath*, an expedient which is hazardous, in the early stages at least, of *hemiplegia*. Hence the Bath waters, and more especially the use of the *hot pump*, commonly succeed in removing the palsy from lead, as well as from cold and rheumatism, although dangerous in cases of *hemiplegia*. There is, indeed, no remedy that appears to possess an equal efficacy: in the palsy from lead, after the disease has resisted all ordinary expedients, the hot-pumping seems to be almost a specific. We have in vain tried the pouring of hot water upon the palsied hand, from the spout of a tea-kettle, held at some height, in those patients, who have afterwards speedily recovered under the pump at Bath. There appears no reason, however, to suppose that any water of the same temperature, poured upon the limb in the same quantity, and with the same impetus, could not equally affect the cure, as the water of Bath; since it is the *quantity* of the stimulation, and not any peculiar quality of the water, that produces that effect.

For the palsy, arising from the poison of lead, and affecting principally the extensor muscles of the hand and fingers, Dr. Pemberton recommended a simple contrivance, which appears to have contributed to accelerate the cure of this disease; namely, a sort of battle-dore of wood, of the length of the fore-arm and hand, which is tied to the former, and supports the latter extended at length. Under this support, he conceives the muscles sooner recover their tone, than when they are constantly stretched by the pendulous hand. See his Treatise on the Diseases of the Abdom. Viscera.

Under all the forms of palsy, a constant exercise of the palsied limb contributes materially to expedite its recovery. This principle is equally applicable to the hemiplegia, as to these partial forms of palsy. To the palsy, or tremors originating from the poison of mercury, neither this nor any of the preceding precepts very clearly apply. The brain, in this case, seems to be affected by the poison, and the whole system suffers from its deleterious influence. Many remedies have been recommended, but especially sulphur, which was suggested perhaps upon chemical notions, rather than from a proper estimate of its operation upon the living body. On the whole, the disease is very unmanageable, and we know not how it is to be cured. The manufacturers, (among whom it almost exclusively occurs,) viz. watch and button-gilders, silversmiths, &c. have contrived means of preventing the mercury, especially when used in its most pernicious form, vapour, from entering into the body so fully as formerly; and, therefore, the disease is become less frequent. But even now, as we are informed, the persons employed in what is called water-gilding, that is, in laying an amalgam of gold and mercury upon the articles to

be gilded, and driving off the mercury by evaporation, are generally short-lived from this cause.

PALSY, *Eleuary for the*, is made of powdered mustard-seed and conserve of roses, of each an ounce, with as much syrup of ginger as is sufficient to make an electuary. A tea-spoonful of this may be taken three or four times a day.

PALSY, *Infusion for the*. See **INFUSION**.

PALSY Drops, in *Botany*. See **LAVANDULA**.

PALTE', in *Geography*. See **JAMRO**.

PALTERCAMP, a town of Westphalia, in the bishopric of Osnabruck; 14 miles S.S.E. of Osnabruck.

PALTZ, New, a township of America, on the west side of Hudson's river, in Ulster county, New York, about 20 miles N.W. of Newburgh; containing 3255 inhabitants, including 308 slaves.

PALVARYA, a town of Hindoostan, in Oude; 32 miles E. of Kairabad.

PALUDAMENTUM, in *Antiquity*, a garment worn by the Romans in time of war; being the coat of arms of their principal men, especially the generals; who, for that reason, were distinguished by the appellation *paludati*.

The soldiers only having short coats, were therefore named *pagati*.

This garment was open on the sides with short sleeves, by some resembled to angels' wings; and came down no lower than the navel. It was either white or red. Valerius Maximus remarks, it was an ill omen to Crassus, that they gave him a black paludamentum: "Pullum ei traditum est paludamentum, cum in prælium euntibus album, aut purpureum, dari solet."

Cornutus says, the Romans wore the toga in peace, and the paludamentum in war. And hence the phrase, "Togam paludamento mutavit." See **CHLAMYIS**.

PALUDE, in *Geography*, a town of Turkish Armenia, in the government of Erzerum, the residence of a prince, partly independent of the grand signior. N. lat. 38° 35'. E. long. 39° 14'.

PALVERETO, a town of Naples, in Calabria Citra; 10 miles E.N.E. of Cofanza.

PALUM SANCTUM, in *Botany*, a name by which some authors have called a species of the guaiacum-tree, called the *lignum sanctum*, or holy wood.

PALUMBARIUS ACCIPITER, in *Ornithology*. See **FALCO Palumbarius**.

PALUMBUS, or **RING-DOVE**. See **COLUMBA**.

PALUS, in *Antiquity*, a military exercise among the Romans, by which the young men prepared, and qualified themselves for real combat. The palus was a pillar, about six feet high, fastened into the ground: against this the soldiers made an attack, assailing it in several different modes and attitudes; always taking care so to manage their weapons, that, supposing it was a real enemy, they might not expose any part of their body to be hurt, while they were striking their adversary. Instead of a sword, they used a rod or stick. They likewise ran at the palus with lances, and threw javelins and darts at it, endeavouring to hit particular parts; and their success was a proof of their dexterity. See **PALE**.

PALUS Maotis, in *Ancient Geography*. See *Sea of AZOF*.

PALWAL, in *Geography*, a town of Hindoostan; 35 miles S of De'hi.

PALY, or **PALÉ**, in *Heraldry*. When an escutcheon is divided into six, eight, or ten divisions, pale-wise, *i. e.* by perpendicular lines drawn from the top to the bottom, it is blazoned paly of six, eight, or ten, &c. pieces.

If the number be odd, then the field is first named, and the number of the pales specified. See **PALE**.

The like is to be understood also of *barry* and *bendy*.

PALY-BENDY is, when a coat is divided, both pale and bend-wise: in paly-bendy, the field is divided by perpendicular lines, which is called *paly*; and then, again, by diagonals crossing the former, from the dexter side to the sinister, which is the *bendy*. The field is paly-bendy, topaz and diamond.

PALYANGHA, in *Hindoo Mythology*, a name of the Hindoo goddesses Bhavani, or Parvati, consort of Siva.

PAMADA, in *Geography*, a town of Birmah, on the Ava; 24 miles N. of Prome.

PAMAKASSAN, a town on the north coast of the island of Madura.

PAMALANG, a town on the north coast of the island of Java. S. lat. 6° 45'. E. long. 109° 28'.

PAMANAKAN POINT, a cape on the north coast of Java. S. lat. 6° 12'. E. long. 107° 54'.

PAMANDOOOR, a town of Hindoostan, on the coast of Tinevelly; 10 miles N. of Tutacurin.

PAMBAMACA, a lofty mountain in the province of Quito, being one of the peaks of the eastern Cordilleras.

PAMBŒOTIA, *παμβοιωτια*, in *Antiquity*, a festival celebrated by all the Bœotians, who assembled near Coronea, at the temple of Minerva, surnamed Itonia.

PAMBU, in *Geography*, a town of Thibet; 20 miles E. of Tankia.

PAMEA, in *Botany*, a name which seems to have no meaning, Aubl. Guian. 946. t. 359. Juss. 76, is applied by the former author to a tree of Guiana, of which he knew nothing but the *calyx* and the *fruit*. From these however he rightly deduced its affinity to the Linnean *Terminalia*, of which it appears to be, as Jussieu suspects, undoubtedly a species. Its *trunk* is thirty feet high, and two or more in diameter; the *branches* widely spreading, knotty. *Leaves* oblong, entire, stalked, many together at each joint, in a spreading, whorl-like cluster. *Fruit* racemose, each consisting of a triangular, oblong, brittle *drupa*, with an ovate-oblong, angular, furrowed *nut*, about an inch and a half long, whose kernel is very good eating; on which account the tree is cultivated in Guiana, and the isle of Bourbon. See **TERMINALIA**.

PAMENE, in *Geography*, a town of the island of Ceylon, on the east coast; 55 miles S. of Trincoli.

PAMER, a lake of Prussia; 12 miles W. of Lick.

PAMIERS, a town of France, in the department of the Arriège, and chief place of a canton, in the district of Mirepoix, near which is a medicinal spring; 12 miles W. of Mirepoix. The place contains 5300, and the canton 10,600 inhabitants, on a territory of 235 kilometres, in 22 communes. N. lat. 43° 6'. E. long. 1° 42'.

PAMISUS, in *Ancient Geography*, a river of Messenia, which had its source in the mountains that lay towards the north between Messenia and Arcadia, ran north-east, and discharged itself into the sea, at the extremity of the Messenian gulf.—Also, a river of Greece, in Thessaly.—Also, a river of Lower Mæsia, in the environs of Odesius, called by Ptolemy *Panyfus*, and placed between Odesius and Mæsambrina.

PAMLICO SOUND, in *Geography*, a large bay on the east coast of North Carolina, which is a kind of lake or inland sea, from 10 to 20 miles broad, and nearly 100 miles in length. It is separated from the Atlantic ocean, in its whole length, by a beach of coral hardly a mile wide, generally covered with small trees or bushes. Through it are several small inlets, by which boats may pass; but Ocre-cock

cock inlet is the only one that can admit vessels of burden into the districts of Edenton and Newburn. Pamlico sound communicates with Albemarle and Core sounds; and it receives Pamlico or Tar river, the river Neus, and other small streams. The mouth of Pamlico river is in N. lat. $35^{\circ} 25'$. W. long. $76^{\circ} 42'$.

PAMMACHION, *παμμαχιον*, a name by which the exercise *pancratium* is sometimes called, whence the combatants were likewise called *panmachi*, *παμμαχιον*.

PAMMELIA was a title given to the first collection of canons, rounds, and catches, that was printed in England. The full title of these ingenious and exhilarating effusions for social purposes is curious, and runs thus: "Pammelia (a word formed, perhaps, from *παιον* and *μελο;*) Musick's Miscellanie; or, mixed varietie of pleasant Roundelays and delightful Catches of 3, 4, 5, 6, 7, 8, 9, 10 parts in one. None so ordinarie as musical, none so musical as not to all very pleasing and acceptable. London, printed by William Barley, for R. B. and H. W., and are to be sold at the Spread Eagle at the north doore of Paules," quarto, 1609. The names of none of the composers of these epigrammatic and pointed effusions have been preserved; but many of them seem of great antiquity, which is discoverable both by the words and style of composition. Great musical science is manifested in the canons, and the harmony and contrivance of the rest are excellent. The words, indeed, except those of the canons, which consist of small portions of the psalms, and other parts of scripture, in Latin, (which seems to imply that they were set before the Reformation,) are, in general, devoid of wit, humour, poetry, and common sense. Our lyric poetry, during the 16th and part of the 17th century, was in a barbarous state, and far inferior to the music of the times. But the composers seemed so little solicitous about the words they had to set, as frequently to prefer the syllables of solmisation *Ut re mi fa sol la*; *Hey down down, derry down*; or merely *Fa la*, to songs of Spenser and Shakspeare. In the same year was published another collection, entitled "Deuteromelia, or the second Part of Musick's Melodie, or melodious Musicke of pleasant Roundelays, &c. London, printed for Thomas Adams, dwelling in Paules Church-yard, at the sign of the White Lyon, 1609." This publication is much inferior to the preceding, and chiefly consists of songs for three voices, in which different stanzas are sung to the same music, after the manner of what are now called *glees*.

PAMMENOCKE POINT, in *Geography*, a cape on the north coast of New Guinea. S. lat. $0^{\circ} 24'$. E. long. $133^{\circ} 21'$.

PAMNAGUR, a town of Hindoostan, in the circar of Kitchwara; 13 miles N.W. of Burdwar.

PAMOACAN, a town of Borneo, on the east coast, near the fourth part of the island; 150 miles N.E. of Banjer-Massing.

PAMODURIE, a town of Hindoostan, in Myfore; 20 miles S. of Tademeri.

PAMPA-HERMOSA, a town of Peru, in the diocesse of Truxillo, and province of Pataz, on the west bank of the Gualaga, inhabited by Indians.

PAMPANGAN, a town of the island of Luçon, capital of a province, which is both extensive and populous. The inhabitants have, in general, adopted the religion and manners of the Spaniards. The town is situated on the east coast. N. lat. $15^{\circ} 5'$.

PAMPARA, a town of Africa, in Bambarra; 156 miles W. of Sego.

PAMPAS, a province of South America, in the viceroyalty of Buenos-Ayres, consists of vast plains, which ex-

tend from the sea-coast on the east to that great chain, which forms the beginning of the Cordilleras of Chili, about 140 leagues west from the city of Buenos-Ayres. Towards the south, they stretch about 100 leagues to a chain proceeding W.N.W. from the Atlantic. The northern boundaries are not distinctly known, but the name of Pampas is chiefly applied to the territory on the south of Buenos-Ayres, Cordova, and Mendoza. These vast plains, like the Steppes of Russia, having scarcely any elevations: the view, as at sea, is terminated by the horizon. They are only diversified with paths and ditches, which collect the rain-waters, and which commonly end in lakes, as there is no declivity; yet there are wide tracts in which no water is found, nor is that element pure; and trees are extremely rare, except a few shrubs round the lakes. Hence this region is only inhabited by a few wandering savages. The soil is generally a black earth, of little depth, and is followed by a kind of coarse white chalk, so that it is difficult to form wells, as the water can scarcely pass so tenacious a substance. The chief pasturage is clover, and, in the best parts, sometimes so strong as to resist the step of a horse: it is much liked by the cattle, which, when there is water, multiply prodigiously in the Pampas. The savages who roam through these deserts sometimes surprize Spanish caravans, and small settlements. Pinkerton.

PAMPAS del Sacramento, immense plains in Peru, lying between the Gualaga and the Maranon west and east, bounded by the Tunguragua on the north. The names "Montana Real" and Pampas del Sacramento have been confounded; whereas the former, in its strict original acceptation, implied a mountainous region of no great extent, to the east of the provinces of Tarma and Guanuco; whilst the latter has been carried to an immense extent, so as to include the vast territories on the north and south of the Maranon, as far as the line of demarcation with the Portuguese settlements. In this acceptation the medial length from the country of the Majos, S. lat. 15° , to the river Guaviari, N. lat. 3° , is 18° , or 1080 geographical miles. The breadth depends upon the Portuguese frontier, but the medium may be 10° , or 600 geographical miles.

The name of Pampas del Sacramento, plains or steppes of the holy sacrament, was imposed by the pious fathers on an enormous territory, watered by the Ucayal or genuine Maranon, and which they fondly represent as being as large as Europe; but they deserve greater credit when they inform us, that it is about 8000 leagues square, and capable of maintaining five millions of inhabitants. The recent discovery of the Pampas is chiefly owing to father Girval, who has navigated about 400 leagues south to north, and 70 west to east, on the grand and genuine Maranon, and has inspected and described the country with considerable care. He has discovered 25 nations, or rather tribes of Indians, of whom he pretends to have converted four, *viz.* the Panos, Cambos, Chipeos, and the Piros. The common deity of all the tribes he found to be the Moon; and they dread a demon, called the "Nugi," whom they regard as the author of all their calamities. In war, for the conduct of which they elect a chief of the greatest courage and cunning; and in the prosecution of their contests, the men are slain, and women and children only become captives. Some tribes are more courteous and humane; while others, as the Casivos and Carapachos, are anthropophagi. The Carapachos are about 8° S. lat., on the bank of the river Pachitea; and the Chipeos, at $7^{\circ} 35'$. Among all the nations on this part of the genuine Maranon, circumcision is practised among the men, and excision among the women. The Capanaguas, a tribe on the river Mague, dress and eat

their dead, and think this action meritorious; and yet they are one of the most humane tribes.

The Pampas del Sacramento are divided from the Sierra, or the hills of Peru, by a lofty chain, from which this vast country appears so level that it resembles the ocean. The perpetual verdure of its fields forms a delicious perspective; and for some hours in the day, there is so thick a fog on the tall trees, that the clouds seem to be under your feet. Rain and thunder are frequent. Insects and reptiles are abundant. Many of the vegetable products are rare and singular. Balsams, oils, gums, resins, incense, cinnamon, though inferior to that of Ceylon, cacao, cascarilla, and an excellent spice, called the pucheri, are very plentiful. But the warmth and humidity render a country, equal in size to an Asiatic empire, almost uninhabitable; and even the few traders on the banks of the rivers rarely see a man of the age of 50. Yet the missionaries have founded several villages. New entrances have been found to the Montana reale, Pampas, or rather great territory of Colonna, since the late missions were established. For further particulars, we refer to Pinkerton's account of recent discoveries, 1790—1800, in the 3d volume of his Geography.

PAMPËL, a town of the duchy of Courland; 24 miles S. of Goldingen.

PAMPÉLONNE, a town of France, in the department of the Tarn, and chief place of a canton, in the district of Alby; 12 miles N. of Alby. The place contains 1839, and the canton 5896 inhabitants, on a territory of 105 kilometres, in 10 communes.

PAMPHELIS, in *Ancient Geography*, a town of Asia Minor, on the confines of Pamphylia, near a mountain called "Climon." Strabo says, that it was a considerable town; and that it had three ports and a lake.

PAMPHILUS, in *Biography*, a presbyter of Cæsarea, in Palestine, is supposed to have been a native of Berytus in Phœnicia, and a descendant from a good family. Having received the rudiments of an excellent education at his native place, he went to Alexandria in Egypt, where he completed his studies, and then settled at Cæsarea. Here he became intimately acquainted with Eusebius, who has given many testimonies of his sincere respect for the memory of his friend, and added his name to his own. Pamphilus is supposed to have flourished about the close of the third century. He was possessed of such zeal for the interests of religion and sacred literature, that he founded, at a great expence, a library at Cæsarea, which contained all the most celebrated writers of the church, collected from all quarters. He was concerned with Eusebius in publishing a correct edition of the Greek version of the Seventy, from Origen's Hexapla. He was jointly concerned with Eusebius, in writing five books of "An Apology for Origen;" to which Eusebius added a sixth. He is thought, by some learned men, not only to have founded a library, but also a school or academy, at Cæsarea. Lardner, however, seems to doubt the fact; though he says, he is not prepared to contest it.

In the year 307, when the persecution raged against the Christians, Pamphilus was apprehended, and carried before Urbanus, the Roman president at Cæsarea, who, after trying his knowledge in various ways, required him to offer sacrifice. Pamphilus steadily refused to obey him, despised his threatenings, and bid defiance to his malice. In the year 309, after he had endured, with the greatest constancy, a variety of tortures inflicted upon him, he was put to death by the orders of Firmilianus, who had succeeded Urbanus in the presidency of the city. Eusebius, in speaking of Pamphilus, says, that "he was the great glory of the church of Cæsarea, and, on account of his eminent virtue,

the most renowned martyr of the age: a man, who, throughout his whole life, excelled in every virtue; in contempt and renunciation of this world, in liberality to the indigent, in disregard of all earthly honours and preferments, to which he might have aspired, and in an ablemistic philosophical course of life. But he was especially eminent, and remarkable above all men of our time, for an unfeigned zeal for the holy scriptures, and for unwearied application in whatever he undertook, whether it were kind offices to his friends, or to others who sought his aid." Dupin. Lardner. Gen. Biog.

PAMPHYLIA, in *Ancient Geography*, a considerable province of Asia Minor, and which included Pisidia, that occupied the northern part. Pamphylia was bounded on the south by the Mediterranean, and extended along the coast from mount Climax, which separated it on the west from Caria, as far as the chain of mountains which separated it on the east from Cilicia; to the north it had Phrygia. The principal towns of Pamphylia, commencing westward, were Olbia, at the mouth of the Cataractes; Perga (Karakhisar) towards the east, at a small distance from thence, on the Cestrus; Aspendus to the south-east, on the Eurymedon; Sede (Cordeloro) directly south, on the sea-coast; Cibyra (Ibuzar) situated to the north-east; Lyrbæ to the north-east; and Corybrassus on the Melas. Towards Phrygia were Tormessus (Elsenaz), a principal town of the people called Solymi, and of the small country called Cabalia; Cormosa; Cremna (Kabriacz) to the north-east; Sandalium, a fortress north-west of Cremna; Baris, south-east of Cremna, in which the Romans established a colony; Lyfinoe (Ag-Jafon), east of Cormosa; Trogitis (Egridi), south of a lake, and south-east of Cremna; Oroanda (Haviran), north of the lake; Seleucia Ferrea (Eushar), at some distance east of the lake; and Petnelissus, south-east of Selga and Catenna, upon the Eurymedon, towards the north-east. Isauria is found within the limits assigned by M. d'Anville to Pamphylia. See ISAURIA.

PAMPILHOSA, in *Geography*, a town of Portugal, in Estramadura; 34 miles N.N.E. of Thomar.

PAMPINIFORME CORPUS, or *Plexus Pampiniformis*, in *Anatomy*, the veins of the testis, which communicate and divide very frequently. See GENERATION.

PAMPLIEGA, in *Geography*, a town of Spain, in Old Castile; 12 miles S.W. of Burgos.

PAMPLONA, or PAMPÉLUNA, a city of Spain, and capital of the province of Navarre, partly situated on a little eminence, and partly in a fertile plain, on the banks of the Arga, near the Pyrenées. It is surrounded on all sides by lofty mountains, at the distance of two or three leagues. This city is said to have been built by Pompey, after the defeat of Sertorius, whence it derived the name of Pompeiopolis. It is a fortified town, and defended by two castles, one in the town and the other contiguous, though without the walls. This last place, which is the citadel, was built by Philip II.; it is strong from its situation on a rock; it has five bastions covered with stone, and good fosses; a deep marsh, of considerable extent, renders the approaches to it difficult towards the side on which it could be attacked. This citadel has a handsome tower, several magazines, a square ornamented with trees, and an armory in the centre of the fortrefs; which is round, and opens by five grand and open streets, which lead to the five bastions. Here is a hand-mill of ingenious construction, that would be useful in case of a siege; it is a large machine, composed of several wheels, which turn five grinding-stones, with as many hoppers; 120 loads, or 360 quintals of wheat, may be ground with it daily: it is turned with the hand, or

may be worked by horses. This town boasts of having been the first in Spain which received the light of the gospel; its bishopric, one of the most ancient in Spain, was re-established after the expulsion of the Moors; it is suffragan to Burgos. The chapter of the cathedral comprehends twelve dignitaries, as many canonries, and forty-four prebends and chaplaincies. There is another chapter in the same cathedral. This town is the residence of the viceroy of Navarre. Its population consists of about 2800 families, composed of nearly 14,000 persons, occupying 1632 houses. In this capital of Navarre the flutes held their fittings. The college for the instruction of youth is an university, founded in 1608. Pampeluna contains a cathedral, three parishes, nine convents of monks, and two of nuns.

The city itself is confined and ill-built, but its streets are kept remarkably clean. There are some squares, two of which have tolerably handsome houses, particularly that which is appropriated to bull-fighting. The town is destitute of agreeable society, which some have ascribed to the severity of the police. The commerce consists merely of imports, and its manufactures are few and inconsiderable. Those of parchment and of leather, and another of coarse cloth, are of little importance; here also they make common earthenware, and blanch wax, which they import; 78 miles N.N.W. of Saragossa, and 172 N.N.E. of Madrid. N. lat. 42° 50'. W. long. 1° 46'.

PAMPLONA, or *Pampeluna*, a town of South America, in the new kingdom of Granada; having in its vicinity gold mines; 170 miles N.N.E. of Santa Fé de Bogota. S. lat. 6° 30'. W. long. 71° 36'.

PAMPUS, a channel between the Zuyder see and Amsterdam.

PAMPUS, in *Ichthyology*. See *STROMATEUS Paru*, and *CHÆTODON Glaucus*.

PAMUCHLEN, a name by which some call the species of cod-fish, commonly named by authors *afellus striatus*. See *GADUS Callarias*.

PAMUNKY, in *Geography*, the ancient name of York river, in Virginia; but now restricted to the southern branch formed by the confluence of the N. and S. Anna. This and the northern branch, Mattaponi, unite and form York river, just below the town of De la War.

PAN, in *Mythology*, the son of Mercury and Penelope, and the deity who presided over huntsmen, shepherds, and those whose occupations led them to frequent the fields. The fable says, that Mercury transformed himself into a he-goat to please Penelope; and to this circumstance is attributed the origin of his horns and cloven feet, as well as the whole tribe of fauns and satyrs. He is called *Pan*, Πᾶν, it is said, because Penelope, in the absence of Ulysses, granted favours to all her lovers, and Pan himself was the fruit of this intercourse. However, Epimenides says, that he was the son of Jupiter and Calista; others say, that he was the son of the Air and a Nereid, or of the Heaven and Earth. He is commonly represented with a shepherd's crook, and a kind of flute, with many pipes. He was particularly revered among the Arcadians, to whom he issued oracles, and who celebrated, in honour of him, the Lupercalia. Evander carried the worship and feasts of Pan to Rome.

The Egyptians give a different account of this deity. According to them, he was one of the generals of Osiris, who engaged with Typhon; and whose army being situated in a valley, all the avenues of which were guarded by the enemy, he ordered the soldiers in the night to march with loud exclamations, which being returned in echoes, terrified the enemy, and put them to flight; whence they say comes the expression of *panic* terror. But Bochart pretends that there

is no other reason for making Pan the author of those terrors, except that the Hebrew word Pan or Phan, denotes a man under consternation. Diodorus Siculus says, that Pan was so much honoured by the Egyptians, that his statues were to be seen in all the temples, and that to his honour they had built in Thebais the city of Chemmis, that is, the city of Pan. This author, who takes no notice of Mendes in Lower Egypt, where that god was in high veneration, adds, that he had accompanied Osiris in his expedition to the Indies, together with Anubis and Macedo. We do not learn from Herodotus why the Egyptians represented the god Pan under the figure of a goat; but ancient mythologists assure us, that they were induced to do this, because Pan, having found the gods in Egypt, whither they had fled from the giants, advised them, as the means of preventing their discovery, to clothe themselves with the figures of different animals; and as a pattern to them, he himself assumed that of a goat. Upon the whole, all the Greek fables relating to Pan are said to amount to these particulars: that he was one of the greatest gods of Egypt; that he was honoured especially at Mendes; that his worship was brought into Greece by the Egyptian colonies; that he became more remarkably famous in Arcadia; that Evander made him known in Italy, where he came and settled with his colony some years before the Trojan war; and that at last the worship of this god was received at Rome with the festivals which were celebrated to his honour. Polyænus attributes to Pan the invention of the order of battle of the phalanx, and of the distribution of an army into the right and left wings, or horns, whence, it is said, he derived his horns. The name Pan, which signifies *all*, has led some to make him the symbol of nature.

Diodorus makes Pan one of the attendants upon Osiris in his Indian expedition. The same author, however, tells us, that he was the leader of a troop of fauns and satyrs, or wild and rustic men, much addicted to singing, dancing, and feats of activity, who were presented to Osiris in Ethiopia; and with whom that prince was so much pleased, that he retained them in his service.

Pan was the inventor of the instrument called the syrinx, or fistula; which invention has given birth to a fable in Ovid's *Metamorphoses*.

A nymph of late appear'd, as Dian chaste,
Whose beauteous form all other nymphs surpass'd;
The pride and joy of fair Arcadia's plains,
Belov'd by deities, ador'd by swains,
Syrinx her name; by Sylvans oft pursu'd,
As oft would she the wanton gods delude.

Descending from Lycæus, Pan admires
The matchless nymph, and burns with new desires.
A crown of pine upon his head he wore,
And vainly strove her pity to implore:
For ere he could begin, she took her flight,
And, wing'd by fear, she soon was out of sight,
Nor stay'd to hear the courtship of the god,
But bent her course to Ladon's gentle flood;
There by the river stopt, and tir'd before,
Relief from water-nymphs her pray'rs implore.
Now while the am'rous god, with speedy pace
Just thought to strain her in a fond embrace,
He fills his arms with reeds, new rising on the place. }
And while he fights, his ill-succes to find,
The tender canes were shaken by the wind;
And breath'd a mournful air, unheard before,
Which greatly Pan surpris'd, yet pleased him more.

Admiring

Admiring this new music, Thou, he said,
Who can't it not be the partner of my bed,
At least shalt be the comfort of my mind,
And often, often, to my lips be join'd!
The tuneful reeds he form'd, and wax'd with care,
Which still retain the name of his ungrateful fair.

Dryden.

Pan was regarded by the Egyptians, after his apotheosis, as the god who presided over the whole universe, as Παν, *omne*, implies. He represented nature and fertility, and was god of the woods and fields, wholly taken up with the pleasures of a country life; dancing constantly with the fauns and satyrs, and running after the nymphs, to whom he was such a terror, that it is supposed by some the word *panic* is derived from *panici terrores*, with which those who were said to have seen him were seized. Apuleius, however, gives an agreeable description of him. "By chance the god, Pan, happened to be seated on a little eminence near a river, and, always constant in his love to the nymph Syrinx, transformed into a reed, he taught her to produce all kinds of agreeable sounds, while his goats were skipping round him, and feeding on the banks."

Lucian describes him as the companion, minister, and counsellor of Bacchus, a servant of *all work*: having been occasionally employed in the capacity of shepherd, musician, dancer, huntsman, and soldier. In short, he served not only as maestro di cappella, to direct the Bacchanals, but was so expert in playing upon flutes, and was such an excellent piper on the fistula, that Bacchus was never happy without him. We have the authority of the grave Virgil, and of the sentimental and pious Plato, for his attributes. Pausanias Corinth. cap. 22.

PAN, in *Agriculture*, a term applied to the bed or flooring upon which the cultivated soil lies or is placed. Mr. Marshall, in speaking of the Norfolk soils, remarks, that "immediately under the cultivated soil, a hard crust, provincially 'the pan,' occurs universally. And under this substratum of various qualities an unfathomable ocean of sand may be considered as the prevailing substratum. In some places a hungry gravel, but more frequently an absorbent brick-earth is the immediate subsoil."

And that "marle sometimes rises to near the surface, but seldom so high as the pan. This seems to be universally considered as a distinct something, poisonous in its nature, and partaking neither of the soil nor the subsoil. It is not his intention to ridicule this received opinion; it may be well founded; but to him the pan appears to be a production, not of nature, but of art, or, to speak more accurately, a consequence of the Norfolk culture carried on time immemorial with the Norfolk plough, whose broad flat share, being held invariably in a horizontal position, and (unless in following) invariably at the same depth, the surface of the subsoil becomes formed by the action of the share, the pressure and sliding of the heel of the plough, and the trampling of the horse, into a firm even floor, upon which the soil is turned and returned in the same manner, it would be, if spread on a floor of stone, or other material. But, be this as it may, and whether the pan is a natural or a fictitious production; it is a fact well established, that breaking it up for ploughing below the accustomed depth is very injurious to succeeding crops." And further, that "two reasons may be offered in explanation of this effect; the pan, year after year, and perhaps century after century, has been a receptacle of the seeds of weeds, which, by being trodden, or otherwise pressed into it, have remained there, locked up from the sun and air, and thereby deprived of the power of vegetation. But no sooner are these seeds re-

leased from their confinement, by being brought to the surface with the plough, than they vegetate in myriads to the annoyance of the crop. The other reason is this,—the firm close texture of the pan renders it in a degree watertight, it is at least a check to the rain-water which sinks through the soil, prolonging its stay in the sphere of vegetation. But the pan being broken, the filter is no more: and the rain, which is not immediately retained by the soil, escapes irretrievably into an insatiable bed of sand, or some other absorbent subsoil."

It must, therefore, in many cases of tillage, be highly injurious to break or destroy this crusty layer, which preserves the manures, and contributes much to the production of good crops of different kinds.

PANA, in *Geography*. See PUNA.

PANACA, a burning mountain on the W. coast of New Mexico.

PANACEA, in *Medicine*, from παν, *all*, and ακιουσι, *I cure*, signifies an universal remedy, or one that is capable of curing all diseases.

Among the old practitioners, with whom the discovery of new drugs was often a pursuit of greater interest, than the investigation of pathology, several medicines were esteemed worthy of this appellation. But it is sufficient to take a very superficial view of the various organs subject to disease, of the various kinds of disease that affect the same organ, and of the various ages and constitutions of different individuals, as well as of the different agency of the causes of disease, *e. g.* high living and starvation, sloth and hard labour, cold and heat, the various species of contagion, marsh effluvia, and other morbid exhalations, and the various poisons, animal, vegetable, and mineral, which are deleterious to the animal frame,—it is sufficient to glance at these ever-varying circumstances which necessarily modify the nature of diseases, in order to be satisfied of the absurdity of the attempt to cure them all by one remedy. The pretenders to *panaceas* are, therefore, only found at present among empirical impostors.

PANACEA, *Panaces*, or *Panax*, *all-heal*, is also applied to several plants, by reason of the extraordinary virtues ascribed to them.

There are three of the panaceas peculiarly famed among the ancients: the *Heraclean*, *Asclepien*, and *Chironian*: these were so called from their inventors Hercules, Asclepias, and Chiron.

The first is the *panax Heraclea vera ficulnea folio*, in English, *true all-heal of Hercules*. From the root and stem of this is drawn, by incision, the gum opopanax.

The *Asclepien*, according to some botanists, is a kind of ferula, which Cas. Bauhinus call *Libanotis ferrule folio & semine*.

The *Chironian*, according to some, is a kind of helianthemum: according to Bradley, it is Doria's woundwort.

PANACEA, in *Mythology*, one of the divinities of medicine, the pretended daughter of Æsculapius, to whom were rendered divine honour, as well as to his other children, Hygeia, Thelephorus, and Jaso.

PANACMUS, in *Biography*, a musician, quoted by Aristides Quintilianus, whose definition of music agrees entirely with that of the Chinese. "Music (he said) was not only the order and arrangement of sounds proper to regulate the voice, but was likewise the regulator of all the harmony of nature." See *CHINESE Music*.

PANADA, PANATA, or *Panarella*, a diet consisting of bread boiled in water to the consistence of a pulp; given to sick persons whose digestion is weak, or to whom stronger food would be improper.

The

The word is formed from the name of the principal ingredient *panis, bread*.

It is sometimes made thin, to serve as drink; and sometimes, likewise, is sweetened, &c. to render it more palatable.

PANADOU, or MANADOU, in *Geography*, a bay on the coast of cape Breton island, near the S. part of the gulf of St. Laurence.

PANÆI, in *Ancient Geography*, a people of Thrace, in the environs of Amphipolis. They formed a part of the Hedoni, according to Steph. Byz. and Thucydides.

PANÆTIUS, in *Biography*, a celebrated philosopher among the Stoics, who flourished in the second century before Christ, was a native of Rhodes, and descended from ancestors who had distinguished themselves in the military transactions of the republic. His inclination leading him to the study of philosophy, he became a disciple of Antipater of Tarsus, but did not at this time approve the doctrines of the Stoics. He was a great admirer of Plato, whom he called divine, most wise, and most holy, and he freely borrowed opinions and sentiments from philosophers of every sect. From Rhodes he went to Athens, where he maintained the reputation of the school of Zeno, and had many disciples. His fame having reached Rome, he went thither; his lectures were crowded by the young nobility; and he enjoyed an intimate acquaintance with several eminent Romans, particularly Scipio and Lælius. According to some writers he accompanied Scipio in some of his expeditions, and is said to have rendered him essential services; he at the same time employed his interest with this great man in conferring various benefits on his fellow citizens at Rhodes. Panætius appears to have spent the latter part of his life partly at Athens, and he died at the last-named city, but it is not at all certain in what year. None of his works have come down to us; but his moral doctrines were, doubtless, very excellent, since they are greatly extolled by Cicero, in his treatise "De Officiis." Cicero. Enfield's Hist. Phil.

PANAGE, or PANNAGE, in our *Ancient Customs*. See PANNAGE.

PANAGIA, in *Geography*, a small island in the Grecian Archipelago, scarcely a league in circumference; 16 miles N.W. of Santorin. N. lat. 36° 39'. E. long. 25° 5'.—Also, a town of European Turkey, in Romania; 14 miles N. of Gallipoli.

PANAGRA, in *Ancient Geography*, a town of Africa, in Libya Interior, upon the northern bank of the Niger. Ptolemy.

PANAGUR, in *Geography*, a town of Hindoostan, in Gurry Mundella; 10 miles N. of Gurrâh.

PANAIA, a town of Naples, in Calabria Ultra; 4 miles N. of Nicotera.

PANAMA, or *Tierra Firmé Proper*, a province of South America, in the viceroyalty of New Granada, bounded on the N. by the Spanish main, on the E. by the province of Darien, on the S. by the Pacific ocean, and on the W. by Ve-agua. The towns and villages of this province are mostly situated in small plains along the shore, the other parts of the country being covered with enormous and craggy mountains, which are sterile, and of course uninhabited. In this province are three cities, twelve villages, and a great number of rancheiras or assemblages of Indian huts. Its gold mines are neglected by the Spaniards, who derive greater profit from the pearl fishery, which has engrossed their attention, though this species of traffic is almost abandoned.

PANAMA, the capital of the fore-mentioned province, is a city and sea-port, built on the isthmus of Darien, at the

bottom of a large bay of the Pacific ocean. The first discovery of Panama is ascribed to Tello de Guzman, who landed here in the year 1515, when he found only fishermen's huts, and from its peculiar appropriation to this business, it was called "Panama," denoting a place abounding with fish. In 1518, a colony was established here under Pedrarias Davila, governor of Terra Firma, and in 1521 this place was constituted a city. In 1670 it was taken and burned by the English adventurer, John Morgan; and afterwards rebuilt in its present situation, which is much more convenient, about 1½ league from the former. Being at first generally constructed of wood, it was almost wholly destroyed by fire in 1737, and again rebuilt chiefly of stone. Panama was the seat of a royal audience, abandoned in 1752; and by the fire in 1756, and a decline of commerce, it was reduced to a miserable situation. Nevertheless it is still a strong city, the see of a bishop, and contains several churches and convents. The harbour of Panama is formed in its road under the shelter of several islands, where ships lie safe, at the distance of about 2½ or 3 leagues from the city. After its fall by the loss of the galleons, it was almost completely ruined by a dreadful conflagration in 1784. Its only remaining trade is with the villages in its jurisdiction, and with the province of Veragua, the goods being received by Portobello, mostly from Carthagena: the vessels from Peru commonly return empty. The neighbouring mountains produce excellent wood, especially the most esteemed mahogany (caoba), and cedar, with many precious balsams. The spirit of trade ridiculously maintains itself, as the chief inhabitants of both sexes sell baubles and trifles by means of their slaves. The royal chest is so poor, that it cannot even pay the garrison, which is now defrayed from Carthagena. The trade with Guayaquil is maintained by an easy and short voyage; the passage of the line being rather accompanied with calms, while in the Atlantic it is esteemed dangerous. This circumstance, as Pinkerton suggests, may have led to the name of the Pacific ocean, given by the Spanish conquerors of Mexico and Peru, before Magalhaens had felt its tempests. N. lat. 8° 58' 12". W. long. 80° 15' 15".

PANAMA Shell, in *Ichthyology*, a species of dolium.

PANAMA, in *Geography*, one of the Philippine islands, about 15 miles in circumference, of a triangular form. N. lat. 11° 27'. E. long. 124° 15'.

PANAMARIBA, a river of Guiana, which runs into the Atlantic, N. lat. 6°.

PANAMGOODY, a town of Hindoostan; 25 miles S. of Tinevelly.

PANAMOS, a mountain of Peru, in the diocese of Truxillo; being part of the Andes.

PANAMGOODY, a town of Hindoostan; 18 miles S.E. of Madura.

PANAON, one of the Philippine islands, about 45 miles in circumference, mountainous, but watered with many streams; thinly inhabited. N. lat. 10° 7'. E. long. 125° 12'.

PANAOUÏTICK, a river of Canada, which runs into the Saguenay, N. lat. 48° 24'. W. long. 70° 55'.

PANARA, in *Ancient Geography*, a town of Arabia Felix, in the isle of Panchæa. Diod. Sic.

PANARAGA, in *Geography*, a town of the island of Java, and capital of a kingdom, situated on the southern side of the island; 60 miles E. of Mataran.

PANARCOUCHI, a town of Hindoostan, in the Carnatic; 16 miles from Cuddalore.

PANARD, CHARLES FRANÇOIS, in *Biography*, an ingenious French poet, was born about the year 1690, at Courville, near Chartres. He became distinguished as a

writer

writer for the stage, and produced a number of dramatic pieces of the light and humorous kind, which were in general well received, and some of them are still represented in the French theatre. His satire was never personal, but was directed against vice and folly in general, without making the application to individuals. His works are stamped with facility, nature, sentiment, wit, and good sense; but they are often negligent, prolix, and incorrect. He was uneducated, and drew all from his own sources. He died at an advanced age, in 1765. His works were printed at Paris, in 4 vols. 12mo. in 1763, under the title of "Theatre et Œuvres diverses de M. Panard."

PANARIA, in *Geography*, a town of Prussia, in Oberland; 5 miles S. of Liblitz.—Also, one of the Lipari islands, between Lipari and Stromboli. N. lat. 38° 40'. E. long. 15° 21'.

PANARIS, or PANARITUM, formed probably of *παρονοια*, *q. d.* an abscess at the root of the nails, derived from *παρη*, *juxta*, and *ονυξ*, *unguis*, a word used by some authors to express a whitlow, or *paronychia*.

PANARO, in *Geography*, a river of Italy, which rises in the S. part of the duchy of Modena, and runs into the Po near Bondeno, in the Ferrarese. It gives name to a department of Italy, composed of the duchy of Modena, with Mirandola, containing about 211,448 inhabitants, who elect 15 deputies. Its capital is Modena.

PANARUCAN, or PANAROCAN, a town of the island of Java, on the N. coast, and capital of a kingdom of the same name, near the eastern part of the island. The principal commerce consists of slaves and long pepper. Many of its inhabitants are Portuguese. S. lat. 7° 30'.

PANASA, or PANASSA, in *Ancient Geography*, a town of India, on this side of the Ganges, and on its bank. This is the *Pannab*, or *Parna*, which see. Ptolemy.

PANASNESTI, in *Geography*, a town of Turkish Armenia; 28 miles N.W. of Cars.

PANAT, a town of France, in the department of Aveyron; 17 miles S. of Rhodéz.

PANATELLAH, a town of Hindoostan, in the circuit of Ruttunpour; 40 miles N.W. of Ruttunpour.

PANATHENÆA, *παναθηναια*, in *Antiquity*, a feast celebrated at Athens in honour of Minerva, whom the Greeks called *Athena*.

Harpocration and Suidas refer its institution to Erichthonius IV. king of Athens, who lived before Theseus. Theodoret, alone, says the feast was established by Orpheus.

Be this as it will, till Theseus, this was a particular feast of the city of Athens, and was called simply *Athenæa*: but that prince uniting all the people of Attica into one republic, they afterwards all assisted at the feast; whence the name panathenæa, *i. e.* the feast of all Attica.

In effect all Attica was present; and each people sent a bullock for the sacrifices, and for the entertainment of the vast multitude of people assembled. At first it lasted only one day, but to add to its solemnity, it was continued afterwards for several days.

There were two kinds of Panathenæa; the *great*, celebrated every five years; and the *little*, every year, or every three years; if we may credit the author of the argument of Demosthenes's oration against Midias.

The ceremonies were the same in the great and the little Panathenæa; excepting for a *peplus* or banner, on which the actions of the goddess were represented in embroidery performed by maids, with the names of those who had distinguished themselves in the service of the republic; which was only borne at the greater. See PEPLUS.

PANATHENÆAN GAMES. See GAMES.

PANAUR, or PONEAUR, in *Geography*, a river of Hindoostan, which rises near Ouscotta, in Mysore, and runs into the bay of Bengal, near Cuddalore.

PANAX, in *Botany*, a name borrowed from the old Greek botanists, whose *παναξ*, or *πανακνι*, was so denominated from *παν*, *all*, and *ακος*, *a medicine*, because of its abundant virtues, and appears by the account in Dioscorides, to have been a broad-leaved umbelliferous plant, though modern writers are not agreed respecting the species. The name therefore being unoccupied, Linnæus very happily adopted it for the Chinese Ginseng, that famous restorative and panacea, whose reputed virtues certainly yield in no respect to the ancient *παναξ*, and which is moreover of the umbelliferous order. Linn. Gen. 554. Schreb. 740. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 448. Juss. 218. Lamarck Dict. v. 2. 713. Illustr. t. 860. Michaux Boreal. Amer. v. 2. 256. Class and order, *Polygamia Dioecia*, or rather perhaps *Pentandria Digynia*. Nat. Ord. *Umbellata*, Linn. *Umbellifera*, Juss.

Gen. Ch. *Cal.* Umbel equal, close. Involucrum of several, small, awl-shaped, permanent leaves. Perianth very small, superior, five-toothed, permanent. *Cor.* universal, uniform; proper of five oblong, equal, recurved petals. *Stam.* Filaments five, very short, deciduous; anthers simple. *Pist.* Germen roundish, compressed, inferior; styles two, erect, small; stigmas simple. *Peric.* Berry heart-shaped, umbilicated, of two cells. *Seeds* solitary, heart-shaped, acute, slightly convex.

Male flowers only are found on a separate plant, in more globose umbels, with larger leaves to the involucrum, a turbinate, coloured, entire perianth to each flower, and longer filaments, which, as well as the petals, are inserted into the perianth.

Eff. Ch. Umbel of many rays. Berry compressed, with two seeds. Petals five, equal, recurved. Calyx five-toothed. Male flowers on a separate plant; their calyx entire.

Obs. This is the only known genus of the true digynous umbelliferous tribe, whose fruit is pulpy. That very natural order is so liable to occasional variations in the organs of impregnation, or, in other words, so many of its genera or species are, more or less constantly, polygamous, that it is desirable they should all be kept together in the *Pentandria Digynia*, to which they properly belong, notwithstanding that difference of structure, which is said to exist between the calyx of the male and that of the perfect flowers. Bernard de Jussieu remarked that there are sometimes three styles and three seeds; and his nephew refers *Panax* to his order of *Aralia*, as does Linnæus to his own, nearly equivalent, order of *Hederacea*. A. de Jussieu moreover suspected that *Cussonia*, of which he knew nothing but from description, was not generically distinct from *Panax*, but we find no authority for believing the fruit of the former to be pulpy, though described in Linnæan language as *dicoccus*, or two-lobed. The smooth, very juicy, and usually beautifully coloured berries of *Panax*, are peculiar and characteristic.

1. *P. quinquefolium*. Gin-seng. Linn. Sp. Pl. 512. Woodv. Med. Bot. t. 99. (*Araliastrum foliis ternis quinquepartitis*; Trew. Ehret. t. 6. f. 1. *Aureliana canadensis*; Lafitau Gin-seng, t. 1.)—Leaves three together, quinate; leaflets stalked. Stem herbaceous.—Native of Chinese Tartary, and of various parts of North America, in mountainous woods. The celebrated Peter Collinson procured it alive from the last mentioned country, in 1740. The plant is perennial, flowering with us in June, but not readily increased, nor preserved without care, in our gardens. The root is spindle-shaped, but mostly divided or branched, pale and yellowish,

PANAX.

of a mucilaginous, sweetish, slightly aromatic, and rather bitterish, flavour. *Stem* herbaceous, erect, round, simple. *Leaves* terminal, three together, on longish stalks; each of five, stalked, very unequal, obovate, pointed, serrated, smooth, veiny leaflets. *Flower-stalk* terminal, between the leaves, solitary, erect, simple, shorter than the footstalks, bearing a simple umbel of several small white flowers, each flower succeeded by a kidney-shaped, or heart-shaped, scarlet berry. For the medical history of this celebrated root, and the mode of procuring it, see GINSENG; where for *Panax* read *Panax*. See also NIXSI and SIUM.

2. *P. trifolium*. Lesser American Gin-seng. Linn. Sp. Pl. 512. (*Aralia* *foliis ternis tripartitis et quadripartitis*; Trew Ehret. t. 6. f. 2. *Nasturtium marianum*, *anemones sylvaticæ foliis enneaphyllon*, *foribus exiguis*; Pluk. Mant. 135. t. 435. f. 6.)—Leaves three together, ternate or quinate; leaflets nearly sessile. *Stem* herbaceous.—Native of North America. Michaux found it at New York, and in Pennsylvania. Miller is said to have had it alive, but never saw the flowers. We received a living specimen from the curious garden of J. Vere, esq. Knightbridge, in May 1811. This plant differs from the former chiefly in being much smaller, the leaflets nearly sessile, and usually only three to each leaf; but the last character is variable, there being very often two small lobes, occasionally becoming distinct leaflets, at the base of the others. Linnæus suspected this to be a variety, or perhaps a male plant, of the true Gin-seng, nor is it improbable that weak plants of that species, perhaps the first season of their flowering, may produce male blossoms only, not having strength to perfect both organs of fructification. There is reason to think the American Gin-seng, when in its full vigour, is of an inferior quality to the Chinese, if indeed it be the same plant, which the observations of father Loureiro, *Cochinch.* 656, render doubtful. He had received the seeds from Tartary, but they did not vegetate. He describes the "fruit as containing seven or eight roundish, umbilicated seeds, rather larger than a peppercorn, brown and of a liony substance." This is totally foreign to the characters of our *Panax*.

3. *P. spinosum*. Spinous Tree Gin-seng. Linn. Suppl. 441. (*Aralia pentaphylla*; Thunb. Japon. 128. Kiôh, vulgo Dara; Kämpf. Amoen. 895?)—Leaves clustered, quinate, crenate. *Stem* arboreous, with solitary spines. *Umbels* lateral, simple. Gathered by Thunberg between Miaco and Quana, and near Jedo, in Japan. A specimen given by him to the younger Linnæus is what the latter described as *P. spinosa*, though Thunberg, who describes neither the pistils nor the fruit, refers the plant to *Aralia*, perhaps on the authority of Kämpfer, who speaks of the seed-vessel as the size of Coriander, with five cells, each of which contains one seed, not unlike that of Flax. We presume this author's synonymy is misapplied, for it must belong to a real *Aralia*. Our specimen has every where but two styles, so that, though the fruit is in no state of forwardness, we must conclude it to have but two seeds. The stem is said by Thunberg to be arboreous and prickly. The branches are round, leafy, with a smooth greyish bark, and furnished with scattered, sharp, horizontal prickles, or rather as they appear to us spines proceeding from the wood, half an inch long. Leaves three, four, or more, from each bud, on smooth footstalks, from two to five inches long, each composed of five slightly stalked, obovate, acute, smooth leaflets, from one to nearly two inches long; unequally crenate upwards; tapering much, and entire, at their base. *Umbels* solitary, stalked, simple, from the same bud with the leaves, much shorter than their footstalks, each of numerous

flowers, on slender partial stalks, with but small traces of an involucre. *Calyx* with five reflexed teeth. *Petals* ovate, reflexed. *Stamens* longer than the petals. *Germen* ovate-oblong. *Styles* two; in some flowers but half the length of the petals, first slightly divaricated, then incurved, with capitate stigmas; in others longer than the petals, erect, parallel, straight, with acute, slightly spreading stigmas. One flower in our specimen has a style of each description. The former are probably abortive, as far as we can judge from other umbelliferous plants. Thunberg says this species flowers in May and June. The corolla appears to be white. Nothing could have determined this plant to be that of Linnæus, except the authority of an original specimen; for the difference between these writers, as to the genus and order, implies that they had counted the styles.

4. *P. arboreum*. Serrated Tree Gin-seng. Forst. Prodr. 75. Linn. Suppl. 441.—Leaves fingered; leaflets stalked, strongly serrated. *Stem* arboreous. *Umbels* compound.—Gathered by Forster in New Zealand. The stem is arboreous. *Leaves* alternate? on stout footstalks four inches or more in length, composed of five, six, or seven, spreading, unequal, elliptical or obovate, acute, smooth, coriaceous leaflets, each from two to four inches long, and supported by a partial stalk an inch in length. *Umbels* large, compound and proliferous, of numerous, spreading, smooth rays. *Calyx* wavy, very slightly toothed. We find scarcely any traces of general or partial involucre, nor have we seen the fruit.

5. *P. undulatum*. Wavy Tree Gin-seng. Aubl. Guian. 949. t. 360.—Leaves fingered; leaflets stalked, undulated; downy and rusty beneath. *Stem* arboreous. *Umbels* panicled.—Gathered by Aublet in Cayenne, Hispaniola, and the spacious forests of Guiana, bearing half-ripe fruit in the month of May. The French call it *Arbre de Mai*, or *de St. Jean*; the Indians *Morototoni*, which last word is retained as the specific name in Aublet's letter-press, though not in his plate. The trunk rises to the height of 100 feet, though only two feet thick, with a whitish bark, and a white light spongy wood. The branches are all at the summit, spreading in a round head, leafy at their extremities. *Leaves* alternate, stalked, of about eight stalked leaflets, much resembling the last, except that they are strongly undulated, not serrated, and their under side is clothed with soft dense tawny down. The largest are eight inches long. *Umbels* alternate, collected into large panicles about the ends of the branches, with an ovate rigid bractea at the base of each partial stalk. *Styles* two. *Fruit* sometimes of three lobes. Aublet saw it but half ripe. Every part of the plant is aromatic.

6. *P. attenuatum*. Taper-pointed Tree Gin-seng. Swartz Ind. Occ. 562.—Leaves fringed; leaflets stalked, ovate, crenate, with taper points. *Stem* arboreous. *Umbels* panicled.—Native of mountainous woods in the islands of Guadeloupe and St. Christopher. A tree 40 feet high, with round, smooth, unarmed branches. *Leaves* alternate, on stalks a foot long, whose base is dilated into an ovate, pointed, sheathing intrafoliaceous stipula, such as may be observed in other arboreous species of this genus, as well as of *Aralia*; the leaflets are five, rarely only three, on partial stalks from one to two inches long, broad-ovate, smooth, wavy and crenate, about three inches long, with a taper point more than half that length; their under side pale, with one central rib, and numerous straight transverse ones, connected by reticulated veins. *Umbels* very numerous, on long, racemose, imperfectly whorled stalks, which stalks are themselves collected, about five together, into one large but

imperfect umbel, at the top of each branch. Partial involucre of several minute, awl-shaped, deciduous leaves, like the bracteas. Calyx with five small teeth. Petals ovate, acute. Stamens five. Styles two, rarely three, combined. Stigmas spreading, obtuse. We have not seen the ripe fruit. Swartz thought it a berry; but we rather suspect that he, like ourselves, had only seen dried specimens, and that it is by mistake he terms this plant a shrub.

7. *P. fruticosum*. Shrubby Compound-leaved Gin-feng. Linn. Sp. Pl. 1513. (Scutellaria tertia; Rumph. Amboin. v. 4. 78. t. 33.)—Leaves triply pinnate; leaflets stalked, lanceolate, fringed with slender teeth. Stem shrubby. Umbels paniced.—Native of the island of Ternate, from whence, according to Rumphius, it was brought to Amboyna. This is a shrub, about six feet high, used in its native climate for hedges. The leaves somewhat resemble parsley, whence the Dutch call it Tree Parsley. They are repeatedly compound, their leaflets lanceolate, acute, fringed with slender, almost spinous, teeth. Umbels irregularly collected into panicles. Styles two, rather spreading. Berries purple, resembling those of Juniper. The whole plant has a strong aromatic parsley-like flavour.

8. *P. aculeatum*. Prickly Shrubby Gin-feng. Ait. Hort. Kew. ed. 1. v. 3. 448. L'Herit. Stirp. Nov. v. 2. t. 99, unpublished. (Zanthoxylum trifoliatum; Linn. Sp. Pl. 1455.)—Leaves ternate; leaflets stalked, crenate. Footstalks and branches prickly. Stem shrubby.—Native of China. Dr. Fothergill is said to have cultivated this shrub in 1773, and it existed in the English or French stoves about 1788, when L'Heritier had a figure taken; but we have never met with a living specimen. The stem is shrubby. Branches round, smooth, with a solitary hooked prickle under the insertion of each footstalk. Leaves alternate, their common stalks an inch and half long, with a small recurved prickle at the top; leaflets three, broadly obovate or elliptical, an inch long, on short partial stalks, smooth, crenate or somewhat ferrated. Umbels on simple stalks, longer than the footstalks, usually several together at the extremity of each branch, simple, of numerous rays. Involuerum of many minute downy leaves. Calyx with five short broad teeth. Stamens twice the length of the petals, with large white anthers. Styles two, short, at length recurved, with downy stigmas.

9. *P. simplex*. Simple Lanceolate-leaved Gin-feng. Forst. Prodr. 75. Mart. Mill. Dict. n. 9.—Leaves simple, alternate, lanceolate, ferrated. Umbels compound.—Gathered by Forster in New Zealand. We know nothing of this species but what is given in his *Prodromus*.

10. *P. horridum*. Palmate Prickly-leaved Gin-feng.—Leaves simple, alternate, palmate, ferrated, with prickly ribs. Stem shrubby, very prickly.—Gathered by Mr. Archibald Menzies, at Nootka Sound, on the west coast of North America. The branches are round, leafy, hispid, beset with innumerable yellow prickles, most crowded about the insertion of each leaf. Leaves on long, furrowed, prickly, somewhat downy footstalks, heart-shaped, a span wide, deeply lobed, sharply cut and ferrated, of a fine green; smooth and veiny above; paler beneath, their veins hairy and beset with numerous, yellow, prominent prickles. Flowers numerous, in a terminal hispid cluster or spike, shorter than the leaves, whose lower branches are much elongated, imperfectly umbellate, bearing many crowded yellowish flowers, chiefly male, their stamens being large and conspicuous, their styles small or deficient. The upper part of the cluster consists of crowded, imperfectly umbellate, female flowers, each with two rather spreading styles, and blunt simple stigmas,

but few or no stamens, unless the latter have fallen off early, which seems to have been the case with the petals. Fruit nearly orbicular, pulpy, crowned with the permanent styles. Seeds angular.

We have seen sketches from New South Wales of what appears to be another species of *Panax*, different from all the foregoing, with compound, elder-like leaves, and beautiful blueish berries, of which no doubt we may expect an account in the sequel of Mr. Brown's *Prodromus*.

PANAX, in *Gardening*, contains plants of the herbaceous and shrubby perennial kinds, of which the species cultivated are; the gin-feng (*P. quinquefolia*); the three-leaved panax (*P. trifolium*); and the prickly panax (*P. aculeata*).

Method of Culture.—The first and second sorts are increased by sowing the seeds procured from abroad upon a moderate hot-bed, or in pots plunged into it, in the early spring season; and when the plants have acquired a few inches in growth, removing them into beds or borders where the mould is good, and the situations sheltered.

The third sort is increased by layers or cuttings, laid down or planted out in the summer months in pots, and plunged into the bark-bed of the stove. When they have stricken root, they may be removed into separate pots, and be constantly kept in the stove.

The two first sorts afford variety in the borders, and the last among stove collections.

PANAY, in *Geography*, one of the Philippine islands, of a triangular form, about 180 miles in circumference, populous and fertile, and abounding in rivers. The chief article of exportation is rice. The Indians tributary to the Spaniards amount to about 17,000. N. lat. 11° 15'. E. long. 122° 33'.

PANAYAS, a town of Portugal, in Alentejo; six miles N.W. of Ourique.

PANCALA AUREA, a name of a famous antidote composed of many ingredients, described by Myrepsus.

PANCALE, or PANCALIER, in *Geography*, a town of France, in the department of the Po, on the Po; 12 miles S. of Turin.

PANCARPIA, the name of a sort of cake much used at Alexandria, and usually covered with paper for the sake of its keeping the longer.

PANCARPUS, in *Antiquity*, a sort of spectacle or show, which the Roman emperors frequently exhibited to the people.

The word is formed from the Greek παν, all, and καρπος, fruit. Whence the name was also given by the Athenians to a sacrifice, in which all kinds of fruits were offered.

The pancarpus of the Romans was a kind of chase, or hunt: for the performance hereof, a number of beasts, as hares, deer, bullocks, &c. were shut up in the circus, or amphitheatre; into which trees were frequently transplanted, so as to form a kind of forest, wherein the beasts were let loose; whence the pancarpus was also called *sylva*.

The beasts were thus abandoned to the people, *i. e.* to all who were disposed to share in the pleasure of the chase, who pursued, shot, killed, and cut in pieces, all they could lay hold of. Helioabalus, the Gordians, and Probus, gave this diversion very frequently, and it continued till the time of the emperor Justinian, in the sixth century.

Casaubon, Cujas, Pithou, &c. make the pancarpus and *sylva* the same thing; Salmasius will have them different. The *sylva*, according to him, was such a diversion as that

above described: but the pancarpus a combat, wherein robust people, hired for that purpose, fought with wild beasts; which opinion he confirms from Cassian, Justinian, Claudian, Firmicus, Manilius, and Cassiodorus.

PANCAWIR, in *Geography*, a town of Hindoostan, in the country of Malwa; 60 miles N. of Ougein. N. lat. 24° 14'. E. long. 76 6'.

PANCH, in *Mast-making*, a plank of oak upwards, and fir below, about eleven inches wide, fayed over the hoops to the convexity of the mall on the fore-side, to make a fair surface for the yard to slide up or down, and prevent its chafing or rubbing against the hoops: hence often called rubbing-panch.

PANCH, a thick texture made of plaited rope-yarn, wove very close. It is fastened round the yards or rigging, to prevent their surfaces being rubbed by the friction of some other contiguous object.

PANCHÆA, in *Ancient Geography*, an island of the ocean, upon the coast of Arabia. According to Diodorus Siculus, it was inhabited by natives of the country, Indians, Cretans, and Scythians. In this island was a town called "Panara," whose inhabitants, according to Diodorus, were singularly happy. They had a temple of Jupiter Triphylia, of which this author details all sorts of marvellous circumstances. The other three towns were Hiraia, Dabi, and Oceanis. But the existence of such an island is doubtful.

PANCHAGNI, an expiatory self-inflicted penance resorted to by Hindoo ascetics. The word means five fires; and the mode of the penance is for the devotee to look constantly on the sun, with four other fires close to him. Such devotees are called Tapaswi, and are described in Hindoo books very circumstantially, but not, we may conclude, very faithfully, as "standing, with uplifted arm, without aid or support, day and night, feeding on air, immovable, on the right toe, on the afflicted earth," &c. &c. See TAPAS.

PANCHA-MUKI, a name of the Hindoo deity Siva, meaning five-faced, he being so represented and described in pictures and books. When five-headed he has usually ten hands.

PANCHAW, in *Geography*, a town of Bengal; 43 miles N.E. of Doega. N. lat. 23° 30'. E. long. 85° 38'.

PANCHBEYA, a town of Bengal; 27 miles E.S.E. of Purneah.

PANCHCOWRYE, a town of Hindoostan, in Oude; 20 miles S.S.E. of Bahraitch.

PANCHDOWNA, a town of Bengal; 20 miles N.E. of Dacca.

PANCHGURRY, a town of Bengal; 15 miles N.N.E. of Calcutta.

PANCHGUTCHY, a town of Bengal; ten miles S. of Oliapour.

PANCHMOOL, a town of Bengal; 10 miles E. of Rogonapour.

PANCHPARA, a town of Bengal; 15 miles N.N.E. of Bassin-pour.

PANCHPEER, a town of Bengal; eight miles S. of Oliapour.

PANCHREST, PANCHRESTOS, *παναχρηστος*, formed of *παν*, all, and *χρηστος*, useful, in *Medicine*, a panacea, or remedy for all distempers. See PANACEA.

PANCHRESTARII, among the Romans, are those who prepared the *panchrest*, or *universal remedy*.

PANCHRUS, the name given by some of the ancient writers on natural history to a gem which they say has all colours: probably the opal.

PANCHYMAGOGUE, PANCHYMAGOGUM, formed

from *παν*, all, *χυμος*, juice, and *αγειν*, to draw off, in *Pharmacy*, a purging extract made from aloes, rhubarb, senna, scammony, jalap, agaric, coloquintida, and black hellebore. Its name arises hence, that being a composition of all the kinds of purgatives, it was supposed to have the virtue of purging all the sorts of humours from the body at once.

PANCIATICA, in *Botany*, so named by Piccioli, author of the *Hortus Panciaticus*, published at Florence in 1783, in compliment to his patron the marquis Niccolò Panchiaticchi, president of the Academy of the *Georgofili*, and owner of the garden. See CADIA.

PANCIROLI, GUIDO, in *Biography*, an eminent jurist and antiquarian, son of Alberto Panciroli, who was also a person learned in the law, was born at Reggio in 1523. After he had made a proficiency in classical literature in his native place, he went to Ferrara to study jurisprudence. He pursued the same study successfully at Pavia, Bologna, and at Padua. In the latter university his reputation stood so high, that in 1547, while only a scholar, he was chosen to an extraordinary professorship of the Institutes. When he had taken his degrees, he was, in 1554, promoted to the principal chair, and in two years afterwards he was appointed to the second professorship, in ordinary, of civil law. This honourable situation he held till 1570, when he accepted an invitation from Emanuel Philibert, duke of Savoy, to occupy the law professorship at Turin, with a handsome salary. He continued in that university till he found the situation unfavourable to his health. He found some difficulty in obtaining his dismissal, but at length returned to Padua in 1582. He was now promoted to the first chair of civil law, with a large salary; and notwithstanding the wishes of the popes Gregory XIV. and Clement VII. to obtain his services at Rome, he preferred the tranquillity of his situation at Padua, where he died in 1599. He was author of a number of learned works, of which the principal are as follow: "Commentarii in Notitiam utriusque Imperii et de Magistratibus;" this was not only printed separately, but also in the Roman Antiquities of Grævius: "De Numismatibus antiquis:" "De quatuordecim Regionibus Urbis Romæ:" "Rerum Memorabilium jam olim deperditarum, et contra recens atque ingeniose inventarum, lib. ii.:" also of a valuable treatise which was not published till the year 1637, entitled "De Claris Legum Interpretibus."

PANCIROLLUS, a writer on music, among other arts; but as he belongs as much to all the other arts as to music, we shall leave him to general literature.

PANCLA, in *Geography*, a mountain of Thibet. N. lat. 29° 22'. E. long. 87° 14'.

PANCLADIA, *Πανκλαδία*, in *Antiquity*, a festival celebrated by the Rhodians when they pruned their vines.

PANCO POINT, in *Geography*, a cape on the N. coast of Java. S. lat. 6° 48'. E. long. 112° 44'.

PANCOCA, a town of Peru, in the diocese of La Plata; 30 miles S. of Potofi.

PANCORVO, a town of Spain, in Old Castile, near mountains called "Pennas de Pancorvo;" near midway between Burgos and Vittoria, and four miles W. of Mirardo de Ebro: overhung by an ancient castle.

PANCOVIA, in *Botany*, so named by Willdenow, in memory of Thomas Pancovius, a Berlin botanist, who died in 1665 at the age of 43, having published, in 1654, a quarto volume entitled *Herbarium portatile*, with 1363 wooden cuts, which has since been republished. Willd. Sp. Pl. v. 2. 285. Class and order, *Heptandria Monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth of one leaf, bell-shaped, inferior, in four deep, ovate, rather unequal segments. *Cor.* Petals

four, rather smaller than the calyx, hooded, toothed, plaited and crisped, their claws inserted into the receptacle, at the base of each segment of the calyx. *Stam.* Filament seven, awl-shaped, ascending, hairy half way up, inserted into the receptacle between the two longer segments of the calyx, and twice their length; anthers oblong, incumbent. *Pist.* not observed by Willdenow, who found in place of it a glandular depressed body. Mert, who discovered the plant, noted a solitary pistil. *Peric. and seeds* unknown.

Ess. Ch. Calyx bell-shaped, in four deep segments. Petals four, hooded, plaited, crisped and toothed; with claws. Stamens ascending, longer than the calyx.

1. *P. bijuga.*—Native of Guinea. A tree, with round branches; the young ones clothed with rusty down. *Leaves* alternate, abruptly pinnate, of two pair of stalked, coriaceous, elliptical, entire, smooth, veiny leaflets, each terminating in an elongated blunt point. *Footstalks* of the younger ones downy, of the full-grown ones transversely wrinkled. *Clusters* intrafoliaceous, short, simple, many-flowered, on the last year's branches. *Flowers* downy, on downy stalks. *Braëtes* ovate, obtuse, densely downy, shorter than the flower-stalks.—We have some suspicion that this may possibly be the same genus with *Afzelia*, whose characters are given in Tr. of the Linn. Soc. v. 4. 221, to which the name of *Pancovia* must, in that case, give place, as being of a later date, and by no means preferable in any respect. See AFZELIA.

PANCRAS, in *Geography*, a large parish in the Holborn division of the hundred of Offulton and county of Middlesex, England, is situated on the north side of London, and comprises about 2700 acres of land, including the site of buildings. It is bounded by the parishes of Islington, Hornsey, and Finchley on the north; by Hampstead and Maryle-Bone on the west; by St. Giles in the Fields, St. George the Martyr, St. George-Bloomsbury, and St. Andrew's, Holborn, on the south; and St. James, Clerkenwell, on the east. The increase of houses in this parish within the last forty years has excited the astonishment of all persons, who can recollect its condition previous to that period. The proportion is calculated as upwards of twenty to one. The first augmentation of much consequence happened in the neighbourhood of Tottenham-court-road, about the year 1765, when all the streets near Percy chapel were built. Somers-town was begun in 1786, Camden-town in 1791, Fitzroy-square in 1793, Brunswick-square in 1797, and Tavistock-square about 1800. Kentish-town has been enlarged more than two-thirds within these twenty-five years, and a considerable number of streets have been built between Brunswick and Russel-squares, and the New Road. Many houses have likewise been added at Battle-bridge, and hence this parish is now by far the most populous of any in the vicinity of London. According to the late parliamentary returns (1811), it contains 6743 houses, and 46,333 inhabitants.

Pancras is said to have been a parish before the Conquest; and is mentioned in Domesday book. It derived its name from the saint to whom the church is dedicated. That edifice is of ancient date, and is certainly the smallest parochial church in London, or its vicinity. It consists only of a nave and chancel. In this church and in the surrounding cemetery, are buried most of the Roman Catholics who die in the metropolis, among whom are several eminent French refugees. Here also rest the ashes of the illustrious Paoli, of Mary Wollstonecroft Godwin, of the chevalier d'Eon, and many other persons distinguished in their career of life by their actions or their writings. Besides the parish-church there are, as may be supposed, several chapels appropriated to public worship within this parish. Of these the principal

are, Kentish-town chapel; Percy chapel, near Tottenham-court-road; Fitzroy chapel; Woburn chapel; Bethel chapel, at Somers-town; St. James's chapel; Whitfield's chapel, belonging to the Methodists of Mr. Whitfield's persuasion; and St. Giles's chapel, attached to the parish of St. Giles's in the Fields. Several burying-grounds annexed to other parishes are likewise locally situated in Pancras, as the cemeteries of St. Andrew, Holborn, St. George the Martyr, and St. George-Bloomsbury.

Many public institutions for charitable and other purposes are placed within this parish. At the head of Lamb's Conduit street stands the Foundling hospital, which was first established in 1739, for the maintenance and education of foundlings, and of other poor children who are admitted in their infancy. The hospital for inoculation, and the natural small-pox hospital, are situated in a field close to Battle-bridge turnpike. Both these excellent charities were founded in 1746, but the present buildings were only erected, the former in 1765, and the latter in 1793. In Gray's-Inn-lane is the Welsh charity school, built in 1771; and at Camden-town is the Veterinary college, established in 1791. (See VETERINARY.) In this college is a theatre for lectures and for dissections, and a room for a museum. The present professor is Mr. Colman, who reads lectures on the anatomy, physiology, and pathology of the horse, from November till June. The pupils pay twenty guineas on admission, which includes every expence, and they have besides the great privilege of attending the principal anatomical lectures in the metropolis. Near the college has lately been erected a large workhouse; and in different parts of the parish are several alms-houses and charity schools, which our limits preclude us from enumerating.

At a place called the Brill, on which part of Somers-town is built, was an entrenchment, supposed by Dr. Stukeley to have been the camp of Cæsar. Caen-wood, or Kenwood, at the northern extremity of the parish, is noted for having been the country seat of the celebrated earl of Mansfield, who purchased it in 1755 from the earl of Bute. The pleasure grounds, including the wood, whence the mansion derive its name, comprehend about forty acres, and display, both in their natural and artificial features, much beauty and picturesque effect. Adjoining are the reservoirs belonging to the Hampstead water-works.

A noted place of public entertainment, called Bagnigge-wells, is situated in this parish, in the valley between Pentonville and the Foundling hospital. It was first opened in 1767 as a tea-garden, soon after the discovery of the two mineral springs here, one of which is chalybeate and the other cathartic. Another mineral spring near the church was formerly in great repute, but is now abandoned. The water of this spring was similar in its properties and effects to that of St. Chad's-well near Battle-bridge, which is still held in considerable estimation for its diuretic and aperient qualities. Lysons's Environs of London, vol. iii. edit. 1795. Supplement by the same author, edit. 1811.

PANCRASIUM, in the *Materia Medica*, a name used by some authors for the squill, of the root of which the oxymel of squills is made.

PANCRATIAN VERSE, the name of a sort of Greek verse, consisting of two trochees and a supernumerary syllable: Πενυγε λαιδοργων.

It is so called from its supposed inventor Panocrates, who is said to have lived before the time of Meleager, another poet who flourished under the first successors of Alexander.

PANCRATIASTES, in *Antiquity*, a combatant in the exercise called pancratium.

PANCRATIASTES was also applied to one, who had gained the

the victory in all the kinds of exercise used in the pancratium.

PANCRATIUM, Πανκρατιον, compounded of παν, *all*, and κρατειν, *I overcome*, among the *Ancients*, a kind of intermixed exercise, consisting of the *lucta*, (*palé*), or wrestling, and the boxing, pugilate, or *cæstus*.

The pancratium was the third gymnastic exercise, and was not introduced till long after the others.

The people, who were engaged in these exercises, were called Pancratiastæ; which name was also given to such as did not confine themselves to one exercise, but succeeded in several different ones.

As this exercise partook both of the *cæstus* and the *palé*, as we learn from both Aristotle and Quintilian, the *athleta* borrowed many things from each of these sciences to render himself eminent in the pancratium. It was necessary for him to learn how to trip, and strike, and box, and grapple with his antagonist; to stand with firmness, fall with advantage, and rise with vigour and celerity, or maintain the combat upon the ground; to attack and to defend, to annoy and resist his enemy in every attitude; and to employ in one or other of those purposes every limb, and nerve, and sinew, all the faculties and all the strength of his whole body, which is implied in the word pancratium; and this term gives the best account of an exercise, in which the combatants were allowed (under certain restrictions) to make what use they thought proper of all the arms which nature had given them, both offensive and defensive, and of only those: for neither (as in the *cæstus*) were their hands and fingers bound up or armed, nor their legs and feet prohibited from joining in the battle, nor were they constrained from striking, as in the *palé*. With no further arms than those, however, they were able to mangle and injure one another, that it was thought proper to subject them to some restraints; lest a contest, in which they engaged for victory and honour, should be disgraced by murder or malice, and the combatants be provoked to encounter one another in a manner more becoming beasts than men. An *athleta* was therefore forbidden to kill his adversary designedly, to dig or pluck out his eyes, to tear him with his teeth, or strike him under the ribs with the ends of his fingers; but notwithstanding these restrictions, scope enough was left for the combatants to exercise their skill and strength, their courage and resolution; because it was a common practice for a pancratiast to choke the strength and skill of his antagonist by twisting and entangling himself about his legs and arms; and to endeavour by fatigue, and pain, and suffocation, to worry him into a surrender of the victory. The pancratium was forbidden by the Spartan legislator, whilst he allowed and encouraged many contests no less rude and bloody; for the law of these two exercises requiring that one of the two combatants should yield either in words, or by stretching out his hand or finger, or by giving some other testimony of his so doing, Lycurgus forbade his Spartans to engage in either of them, because, as he said, he would not have them accustom themselves to yield the victory not even in sport. The combatants in these exercises were naked; and as it was necessary to pair them, this, we may suppose, was done by lot. Pausanias speaks of a pancratiast named Soltratus, who had an easy method of obtaining the victory in these contests: his custom was to seize fast hold of his adversary's fingers, which he broke, and never quitted his hold, till they renounced the contest. This method gained him twelve Isthmian and Nemean, two Pythian, and three Olympic crowns, together with a statue at Olympia, and the surname of Acro-Cherites. *West's Pindar*, vol. iii.

PANCRATIUM, in *Botany*, probably Πανκρασιον of Dioscorides, as Dr. Sibthorp found it called ἀγρια σκίλλα, or Wild Squill, by the modern Greeks; and that old writer speaks of it immediately after the true Squill, as a root of similar virtues, denominated by some the Little Squill. Πανκρασιον has been sometimes applied as a name to the *Moly*, and in that case is supposed to be derived from παν, *all*, and κρατις, *power*; an etymology which the reputed virtues of that herb might justify, more than the qualities of the present. These Dioscorides mentions, as like those of the Squill, but milder. *Linn. Gen.* 161. *Schreb.* 216. *Willd. Sp. Pl.* v. 2. 41. *Mart. Mill. Dict.* v. 3. *Ait. Hort. Kew. ed.* 2. v. 2. 218. *Sm. Prodr. Fl. Græc. Sibth.* v. 1. 220. *Juss.* 55. *Lamarck Illustr.* t. 228. *Class and order, Hexandria Monogynia. Nat. Ord. Spatheaceæ, Linn. Narcissi, Juss.*

Gen. Ch. *Cal.* an oblong, obtuse, compressed, membranous sheath, splitting along its flat side, containing one or many flowers, permanent. *Cor.* Petals six, lanceolate, flat, inserted into the tube of the nectary externally, at some distance above its base. Nectary of one leaf, funnel-shaped, regular, cylindrical below, coloured above, having a spreading border with twelve variously shaped segments. *Stam.* Filaments six, awl-shaped, inserted into the rim of the nectary, and usually exceeding its segments in length; anthers oblong, incumbent. *Pist.* Germen inferior, with three obtuse angles; style thread-shaped, longer than the stamens; stigma obtuse. *Perc.* Capsule roundish, with three blunt angles, membranous, of three cells and three valves. *Seeds* several, globose.

Ess. Ch. Petals six. Nectary with twelve segments, bearing the stamens.

Obf. The structure of the nectary, and the insertion of the stamens, afford an excellent instance of an essential generic character, with which no other can be confounded.

1. *P. zeylanicum.* One-flowered Pancratium. *Linn. Sp. Pl.* 417. *Willd. n.* 1. *Ait. n.* 1. *Salisb. Parad.* t. 86. (*Narcissus zeylanicus*, flore albo hexagono odorato; *Herm. Lugdbat.* 691. t. 693. *Commel. Hort.* v. 1. 75. t. 38. *Lilionarcissus zeylanicus*, flore albo hexagono odorato; *Rudb. Elyf.* v. 2. 179. f. 7. *Lilium indicum*; *Rumph. Amboin.* v. 6. 161. t. 70. f. 2)—Sheath single-flowered. Petals recurved. Stamens incurved.—Native of Ceylon, Java, and other parts of the East Indies. It was cultivated by Miller, but is now very rare in the English collections, flowering in the stove about July. The *bulb* is ovate, as big as a hen's egg. *Leaves* several, radical, spreading, linear, three-ribbed, an inch wide, bright green, slightly keeled. *Flower-stalks* one or more, about a foot high, erect, simple, bearing one large white fragrant flower, with yellow anthers, and a cloven greenish sheath. The nectary expands nearly an inch and a half, with twelve equal, acute, triangular, marginal segments, between every pair of which, and opposite to each petal, the stamens are inserted. Their strong inflexion is noted by Rumphius. The petals spread horizontally about four inches, and are linear, recurved at the points.

2. *P. mexicanum.* Mexican Pancratium. *Linn. Sp. Pl.* 418. *Willd. n.* 2. *Ait. n.* 2. (*P. mexicanum*, flore gemello candido; *Dill. Elth.* 299. t. 222.)—Sheath two-flowered. Leaves lanceolate. Six of the segments of the nectary bearing the stamens; the intermediate ones simple.—Native of Mexico. Sherard had it in his garden at Eltham, and Dillenius says the bulbs brought from Mexico flowered in May.—The leaves are broader and more lanceolate than in the former. *Stalk* hardly a foot high, shorter than the leaves, bearing, from one divided sheath, two white scentless

PANCRATIUM.

scentless flowers, with linear narrow petals, about two inches long, and a much smaller nectary than the foregoing, six of whose segments bear the slender spreading stamens from their points, with saffron-coloured anthers.

3. *P. rotatum*. Large-crowned Pancratium. Ker in Curt. Mag. t. 827. Ait. n. 3. (*P. disciforme*; Redout. Liliac. t. 155.)—Sheath with few flowers. Leaves linear. Stamens between the jagged segments of the horizontal nectary. Native of Carolina, in ground that is occasionally overflowed, from whence it was brought by the younger Michaux to Paris, and sent to Mr. Loddige before the year 1803. It flowers in the stove, during most part of the summer, and increases greatly by offsets from the root. Leaves many-ribbed, linear, from half an inch to an inch wide. Flowers two, three, or more, with a segment of the sheath under each, white, nearly a span in diameter, from the great length of the linear channelled petals. The great flatness, and wide expansion, of the cup of the nectary, with its variously-jagged segments, between which the wide-spreading stamens, about twice its length, are attached, form the striking character of the present species, which Michaux in his Flora mistook for the *mexicanum*.

4. *P. calathinum*. White Brazilian Pancratium. Ker in Curt. Mag. t. 1561. (*P. calathiforme*; Redout. Liliac. t. 353.)—Sheath with few flowers. Leaves linear. Stamens between the jagged segments of the cup-shaped nectary, and scarcely exceeding them in length. Tube nearly cylindrical.—Native of the Brazils, from whence it was received by the late lady Amelia Hume, who favoured us with a specimen in May 1794. The leaves are linear, obtuse, an inch wide and two feet long. Flowers two or three from a sheath of as many or more divisions, white, very fragrant, somewhat drooping. Nectary large and cup-shaped, its segments nearly upright, variously and sharply jagged and toothed. Stamens about the length of the segments, and inserted between them, bent inwards, each bearing a yellow anther longer than itself. Redoutè's figure represents the nectary as large as a flower of the common White Lily, with longer and less jagged segments than are exhibited in the Bot. Magazine; but Mr. Ker considers it as merely taken from a stronger plant.

5. *P. Amancaes*. Golden Pancratium. Curt. Mag. t. 1224. Ait. n. 4. (*Narcissus Amancaes*; Ruiz and Pavon. Peruv. v. 3. 53. t. 283. f. a.)—Sheath with few flowers. Leaves lanceolate. Stamens between the abrupt toothed segments of the cup-shaped nectary, and about the same length. Tube with six furrows.—Native of Lima and Peru. Imported from the Brazils, in 1808, by Messrs. Middlemist and Wood at Shepherd's bush, in whose stove it flowered in July 1809. This species is distinguished from all the preceding, by the golden yellow of its flowers, which are described as exceedingly fragrant, and used by the Peruvian women to ornament their hair. The shape and size of the flowers most agree with the last-described, particularly the inflexed posture of the very short stamens; but the segments of the nectary seem more abrupt, and more regularly toothed. The tube of the flower moreover has six strong furrows, and as many rounded angles. The leaves are more lanceolate, and broader, tapering to a point.

6. *P. humile*. Small Pancratium. Cavan. Ic. v. 3. 4. t. 207. f. 2. Willd. n. 3.—Sheath two flowered. Leaves thread-shaped. Nectary cup-shaped, very short, in six obtuse cloven segments. Stamens spreading, as long as the petals.—Gathered by Cavanilles in Andalusia, flowering in October, before the leaves come out. There are two only, scarcely six inches long, very slender. Stalk not quite so tall, slender, thread-shaped, bearing two yellow flowers

from one sheath, on unequal capillary stalks. Petals elliptic-oblong, obtuse, each rather above half an inch in length. Nectary short, and rather fleshy, cup-shaped, in six cloven segments, more resembling that of a *Narcissus*, but Cavanilles expressly says it bears the stamens. The tube is short. Stamens capillary, almost equal to the petals. This appears to us a very doubtful *Pancratium*, and if the lobes themselves of the nectary do not bear the stamens, it ought to be removed to *NARCISsus*; see that article.

7. *P. caribæum*. Caribæan Pancratium. Linn. Sp. Pl. ed. 1. 291. ed. 2. 418. Willd. n. 4. (*P. n. 1*; Brown. Jam. 194. *Narcissus totus albus latifolius polyanthos major odoratus, staminibus sex e tubi amplè margine exstantibus*; Sloane Jam. v. 1. 244. Mart. Cent. t. 27.)—"Sheath many-flowered. Leaves lanceolate."—Native of Jamaica, in lowland woods, very common, as well as in other sugar islands, according to Sloane and Bröwne. The bulb is said to be as large as a man's fist. Leaves two feet long, and about three inches broad, channelled or concave. Flower-stalk flat, two-edged, four feet high, solid. Flowers six, seven, or more, large, white, fragrant; their tube, mistaken by Sloane for a partial footstalk, six inches long; petals five inches long; nectary with six ribs, bearing the very long stamens. This is all we can gather from Sloane. Bröwne says "the root is pretty acrid, and has been sometimes used in poultices by antiquated and pale-faced ladies, to raise a forced bloom in their fading cheeks."—*P. caribæum* is a much-disputed species. Linnæus adopted it from the above authors, adding a reference to Commelin, which certainly belongs to what is now called *amoenum*, see n. 12. He had however an original specimen in his herbarium, sent by Gronovius, with the synonym of Sloane and Martyn; but this specimen consists merely of a few separate flowers, which appear to belong to *amoenum*, but can scarcely be ascertained. In this difficulty we leave the present species as we find it, the above synonyms of Sloane and Martyn not being with certainty referrible to any of the following, whatever may become of the specimen, which neither accords with them, nor could possibly have suggested the specific definition.

8. *P. maritimum*. Sea Pancratium. Linn. Sp. Pl. 418. Willd. n. 5. Ait. n. 5. Cavan. Ic. v. 1. 41. t. 56. Redout. Liliac. t. 8. Salf. Tr. of Linn. Soc. v. 2. 70. t. 9. (*P. carolinianum*; Linn. Sp. Pl. 418. *P. marinum, et floribus rubris*; Ger. em. 172, 173. f. 3, 4.)—Sheath many-flowered. Leaves linear, obtuse, glaucous. Stamens between the twelve entire equal segments of the large cup-shaped nectary, and about the same length, incurved.—Native of the sandy sea-coasts of the south of Europe, frequent in Greece and the neighbouring islands. Gerarde cultivated it in his garden, and it is still occasionally to be seen in collections, flowering in May and June, in the open ground, though much less frequent than the *illyricum*, which Miller mistook for this. Our *maritimum* is, if any of the genus, the true *πανκράτιον* of Dioscorides. It is known by its narrow glaucous leaves, and the large bell-shaped nectary, with twelve short, equal, entire segments, between every two pair of which stands an incurved stamen, not exceeding them in length. Redoutè's plate is excellent. The flowers are fragrant, usually white, but occasionally tinged with a faint red, whence the species was termed *verecundum* in Ait. Hort. Kew. ed. 1, where it occurs twice.

9. *P. littorale*. Tall Pancratium. Jacq. Amer. 99. t. 179. f. 94. Hort. Vind. v. 3. 41. t. 75. Salf. Tr. of Linn. Soc. v. 2. 74. t. 13. Willd. n. 7. Ait. n. 6. Redout. Liliac. t. 154. Curt. Mag. t. 825. (*P. foliis ensiformibus, spatha multiflora, floribus magnis candidis fragrantibus*; Trew Ehret. 6. t. 27.)—Sheath many-flowered. Leaves linear-lanceolate.

Nectary

PANCRATIUM.

Nectary with six teeth bearing the stamens; the intermediate space wavy, obscurely toothed.—Native of the West Indies, said to have been cultivated by Miller in 1758. It flowers in the stove throughout the summer. Linnæus having misquoted the synonym of Trew's Ehret under his *illyricum*, has, as Mr. Salisbury remarks, caused the present species to be sometimes called by that name, though the two are as unlike as possible. The present bears a great number of powerfully-scented, large, white flowers, whose tubes are seven inches long, and their common stalk three or four feet high. *Petals* long, narrow, recurved and pendulous. Cup of the *nectary* wide and shallow, its six principal teeth bearing the very long *stamens*, while the intermediate space is merely wavy, with scarcely the appearance of teeth.

10. *P. fragrans*. Fragrant Pancratium. Salif. Tr. of Linn. Soc. v. 2. 72. t. 11. Willd. n. 6. Ait. n. 7. (*P. foliis amplis ovatis acutis petiolatis, spatha multiflora, floribus minoribus candidis fragrantibus*; Trew Ehret. 6. t. 28.)—Sheath many-flowered. Leaves elliptical. Nectary with six teeth bearing the stamens; the intermediate space wavy and cloven.—Native of Barbadoes, flowering in our stoves in the summer. Mr. Salisbury first well distinguished this species, and suspected that the synonyms above quoted under *P. caribæum* might belong to it, which we can scarcely believe. Willdenow seems to have rightly referred to Trew's Ehret. The scent of the flowers is very sweet. The want of intermediate teeth to the *nectary*, in the place of which there is a notch, and the broad elliptical foliage, well mark this *Pancratium*. The tube of the flower is not half the length of the last.

11. *P. speciosum*. Great West Indian Pancratium. Salif. Tr. of Linn. Soc. v. 2. 73. t. 12. Willd. n. 8. Ait. n. 8. Redout. Liliac. t. 156. (*P. caribæum*; Curt. Mag. t. 826.)—Sheath many-flowered. Leaves elliptical. Nectary with six teeth bearing the stamens; the intermediate ones simple, acute.—Native of the West Indies, flowering in a stove most part of the summer. The leaves are numerous and broad, with contracted stalks. Flowers numerous, large, white, very fragrant, distinguished by the intermediate teeth of their *nectary* from the last. Martyn's t. 27, on which the Linnæan *caribæum* is supposed to depend, is noted in Hort. Kew. as belonging to this species, which may be the case, though the *nectary* is there incorrectly drawn. The present is the finest of the whole genus, and most generally cultivated, by those who have the means to make it bloom in perfection, which sometimes takes place twice in one summer.

12. *P. amocnum*. Broad-leaved Cayenne Pancratium. Salif. Tr. of Linn. Soc. v. 2. 71. t. 10. Willd. n. 9. Ait. n. 9. Andr. Repof. t. 556. (*P. declinatum*; Jacq. Hort. Vind. v. 3. 10. t. 11. *Narcissus americanus, flore multiplici albo hexagono odorato*; Commel. Hort. v. 2. 173. t. 87.)—Sheath many-flowered. Leaves elliptic-lanceolate. Nectary with six teeth bearing the stamens; the intermediate ones acute, deeply cloven.—Native of Guiana. Mr. Salisbury cultivated it before 1790, and Jacquin long before that period. This has narrower leaves, and much smaller flowers, than the *speciosum*, with small cloven intermediate teeth to the *nectary*, which part seems to us well chosen by Mr. Salisbury for the specific differences, notwithstanding the doubts of other authors. The lying down of the stalk, when the seed-vessels are forming, is, as he remarks, by no means peculiar to this kind of *Pancratium*, and therefore he could not retain Jacquin's specific name. Yet it may be doubted whether what he has adopted be equally discriminative.

13. *P. illyricum*. Starry Pancratium. Linn. Sp. Pl. 418. Willd. n. 10. Ait. n. 10. Curt. Mag. t. 718. Redout.

Liliac. t. 153. (*P. stellare*; Salif. Tr. of Linn. Soc. v. 2. 74. t. 14. *P. spatha multiflora, petalis planis, foliis linguatis*; Mill. Ic. t. 197. *Narcissus tertius Matthioli*; Ger. em. 173. *N. constantino-politanus*; Matth. Valgr. v. 2. 580, excellent.)—Sheath many-flowered. Leaves lanceolate, obtuse, glaucous. Stamens between the deep, acute, cloven, widely-spreading segments of the *nectary*, and twice their length.—Native of the south of Europe. Lord Zouch is recorded as having cultivated this species in 1605. It is now not uncommon in our open borders, requiring no particular care, and flowering in May or June. Miller and others have mistaken this for the Linnæan *maritimum*, from which it is totally different. The leaves spread in two ranks, and are very glaucous, rigid, a foot long, concave, one inch and a half wide. Flower-stalk a little inclining, not so long as the leaves, bearing numerous white flowers, of an agreeable scent, and well characterised by their starry appearance, caused by their widely-spreading petals and *nectary*, whose segments are cloven half way down, and much more deeply separated from each other, with the stamens between them.

14. *P. amboinense*. Amboina Pancratium. Linn. Sp. Pl. 419. Willd. n. 11. Ait. n. 11. (*P. nervifolium*; Salif. Parad. t. 84. *Narcissus amboinensis, folio latissimo rotundo, floribus niveis inodoris*; Commel. Hort. v. 1. 77. t. 39. Rudb. Elyf. v. 2. 238. f. 17. *Cepa sylvestris*; Rumph. Amboin. v. 6. 160. t. 70. f. 1.)—Sheath many-flowered. Leaves elliptic-heart-shaped, many-ribbed. Nectary in six deep segments, with two distant teeth, bearing the stamens between their teeth.—Native of Amboyna and Java. We received it from the late Mr. Christopher Smith. Miller cultivated this species in 1759, but it has been lost till within a few years. It flowers in the stove early in spring. The remarkably broad heart-shaped leaves, of a pale green, with many strong ribs, abundantly distinguish this *Pancratium* from all the rest. The flowers are extremely numerous, white, without smell, their shape and proportion most like *illyricum*, the petals being about the length of the tube, but the *nectary* is essentially different, being divided above half way down into six broad wedge-shaped segments, each having two divaricated teeth, and between these teeth the stamens are inserted, extending far beyond them, and about half the length of the petals.

PANCRATIUM, in Gardening, contains plants of the bulbous-rooted, showery, perennial kind, of which the species cultivated are; the sea pancratium (*P. maritimum*); the Illyrian pancratium (*P. illyricum*); the Ceylonese pancratium (*P. zeylanicum*); the Mexican pancratium (*P. mexicanum*); the Caribbean pancratium (*P. caribæum*); the Carolina pancratium (*P. carolinianum*); the broad-leaved pancratium (*P. amboinense*); the narcissus-leaved pancratium, and the *P. speciosum*.

Of the seventh fort there are several varieties; as the *American*, which grows naturally in the islands of the West Indies, where it is called *white lily*; and the *latifolium* and *ovatum* also grow naturally in the same place.

Method of Culture.—All these plants are capable of being increased by planting off-sets from the roots in the latter end of summer, when their stems and leaves decay. The roots may be divided every second or third year.

In the two first sorts, the off-sets may be planted out in nursery-beds for a year or two, to become sufficiently strong, when they may be removed into warm sheltered dry borders; the first being sheltered from frost in severe winters, and the latter in very severe weather, by being covered with tanners' bark, straw, or peas-haulm. The second fort may also be increased by seeds sown in pots, and plunged in a hot-bed.

The other sorts must be planted out in small pots filled with

with light earth, separately plunging them in the bark-bed of the stove. They should be kept constantly in the tan-bed, and have the management of other tender bulbs. In this way they generally succeed well.

The two first sorts afford variety in the dry warm borders of the pleasure-ground, and the other kinds produce variety as well as fragrance in the stove collections.

PANCREAS, in *Anatomy*, a glandular body, situated in the abdomen, and connected to the beginning of the small intestine, in the cavity of which its excretory duct terminates. The structure of this gland so nearly resembles that of the salivary glands, that we refer on this part of the subject to our account of them in the article DEGLUTITION, and to the general remarks in the article GLAND.

The shape of the pancreas is elongated: the right extremity, which is the largest part, is sometimes called the head of the pancreas (*caput pancreatis*): the left, which is smaller, its tail (*cauda*). The length is from eight to ten inches, and corresponds nearly to that of the stomach: the breadth about two inches, and the thickness about one inch. It is much the largest gland in the body of this particular kind of structure. It is said to weigh from two to six ounces; the specific gravity to that of water as 2029 to 1000.

This gland is deeply hidden in the upper and back part of the abdominal cavity—in the epigastric region, where it lies nearly transversely. The right or larger end lies in the concavity of the second curvature of the duodenum, and adheres closely to this intestine for a considerable breadth by a short and dense cellular tissue. The substance of the organ, advancing over the anterior and posterior surfaces of the gut, seems to inclose it. The portion, which lies along the intestine, is much broader than the rest of the gland, and was called by Winslow the pancreas minus, although it is not distinct from the rest. From the duodenum the pancreas stretches across the vertebral column into the left hypochondrium, directed a little upwards as well as to the right. Its left end, which is the smallest part, touches the interior end of the spleen, or is connected to it by the intervention of a portion of peritoneum.

The anterior and posterior surface of the pancreas are nearly flat: but the whole is rather curved in accommodation to the projection of the vertebral column. The anterior surface, inclined forwards and slightly convex, is covered by the upper layer of the transverse mesocolon, through which it can be easily discerned behind the stomach and little omentum. The latter parts lie in front of it, and are in contact with the gland, when the stomach is empty: but when that bag is filled, it rises from the gland, which is then behind its lesser arch. The posterior surface corresponds to the transverse part of the duodenum, from which the superior mesenteric vessels and nerves separate it. The superior edge, thicker than the inferior, and inclined backwards, is connected by copious cellular substance to the aorta and vena cava, the superior mesenteric vessels, and the left kidney and renal capsule. It possesses a groove, in which the splenic artery is lodged. The inferior edge is thin and inclined forwards, and placed between the upper layer of the transverse mesocolon and the duodenum.

The external surface is granulated, and the consistence of the organ, in its recent state, very firm. It becomes softer soon after death, and is very much softened, when putrefaction commences. The colour is a greyish-white, inclining to red.

The excretory duct (sometimes called ductus Wirsungi, from Wirsung, who discovered it in 1642) runs from one end of the gland to the other, nearly in its centre. It is

remarkable for its whiteness, and is less dense and thick than those of the salivary glands. Very fine tubes arise from the glandular acini, and unite together like veins: they end in a single tube, which gradually increases in size, as it proceeds from the left to the right end of the gland, does not follow quite a straight course, and is rather nearer to the anterior than to the posterior surface of the organ. When it arrives near the duodenum it has attained the size of a small writing quill, and it receives a branch rather larger than the others from the part called pancreas minus. It turns a little downwards to join the ductus communis choledochus at an acute angle, and the common tube immediately penetrates the coats of the duodenum, at the lower and posterior part of the second curvature of the intestine. (See LIVER.) The opening is smaller than the diameter of the duct before its end: and Soemmerring states that the entrance of the bile into it is prevented by a valve, “*valvula fimbriata et valde subtilis.*” Sometimes a small canal opens separately at a short distance from the common duct; or the great duct itself may terminate separately from the ductus communis choledochus; or there may be three pancreatic ducts opening into the duodenum.

The texture of the duct is tolerably firm: its internal surface is perfectly smooth.

It has no proper external covering: one surface has the anterior layer of the mesocolon lying on it pretty closely: but the rest of the gland is connected by a loose cellular tissue to the surrounding parts.

The arteries of the pancreas are numerous and small, and produced from the gastro-duodenalis, the splenic and the superior mesenteric: the veins join the superior mesenteric, the splenic and the gastro-duodenal, all of which end in the vena portarum. It has absorbents, in which nothing peculiar has been observed. The nerves, which are very small, and distributed on the arteries only, come from the cæliac ganglia.

The points in which this and the salivary gland agree are; 1, the organisation, including the excretory ducts; 2, the possessing numerous small blood-vessels; 3, the being placed in a situation where they are subject to motion from the surrounding organs. These, in the pancreas, are the trunks of the aorta, superior mesenteric and splenic arteries, the stomach, and duodenum.

In the mammalia and birds, the pancreatic and biliary ducts are sometimes united, sometimes separate: and sometimes there are two pancreatic ducts, one opening into the ductus choledochus, and the other separately.

The pancreas secretes a fluid, called the pancreatic juice or liquor, which is poured by its excretory duct into the duodenum. The difficulty of procuring this in a pure state has prevented any very accurate investigation of its chemical properties: but it appears, from whatever inquiries have been made, very closely to resemble the saliva. (See DEGLUTITION.) The duct is always found empty after death.

In the controversies about the nature of the pancreatic fluid in the seventeenth century, numerous dogs were slaughtered without any very interesting results being obtained. De Graaf placed tubes in the pancreatic ducts of living dogs: phials were connected to the opposite end of them. In this way he collected two drachms, half an ounce, and even an ounce, in eight hours. Schuyl procured two and three drachms in two hours. (See De Graaf de succi pancreatici natura et usu; and Schuyl de veteri medicina.) Brunner attempted to cut out the gland, or to tie the duct in dogs. (*Experimenta nova circa pancreas.*) These tortures were inflicted in the attack and defence of a doctrine promulgated by Sylvius de le Boe, and very generally adopted,

that

that the pancreatic liquor was acid, and the bile alkaline, and that their mixture occasioned a fermentation in the stomach, by which chylification was effected! These notions were employed in explaining disease: the cold stage of fever was ascribed to the acid pancreatic juice, and alkaline remedies were ordered to correct it.

We know that the salivary glands secrete their fluid very largely during mastication (see DEGLUTITION): this analogy leads us to infer that the pancreas must furnish a large quantity of fluid, which is mixed with the chyme from the stomach. As we are ignorant of the quantity and exact nature of this secretion, we cannot be expected to explain what share it has in the changes which our food undergoes in the alimentary canal. Haller's *Elementa Physiologiæ*, lib. 22. Siebold, *Historia Systematis Salivalis*, 4to. Jenæ 1797.

PANCREAS *Afelli*, in *Comparative Anatomy*, the large single mesenteric gland of some animals, which holds the place of the numerous smaller ones. See MAMMALIA.

It has its name from the author who first took notice of it, Afellius. M. Perrault observes, that the fish called plaice, has four hundred and forty pancreases; though it has but five ducts opening into the intestine, three of which correspond to eighty pancreases, and two of them to one hundred a piece. See FISH.

PANCREATIC, in *Anatomy*, an epithet given to various parts situated about the pancreas; as the duct of the gland, its arteries, veins and nerves. See PANCREAS.

PANCREATIC Juice, an insipid, limpid juice or humour separated from the blood, and prepared in the pancreas.

This juice is not acid as most authors have supposed; nor alkaline, as some authors have thought; but a little saline, and much resembling the saliva in its origin, vessels, and properties.

It is carried by the pancreatic duct into the duodenum, where it serves to dilute the chyle, to render it more fluid, and fit to enter the mouths of the lacteals: and perhaps to temper and dilute the bile, to change its viscosity, bitterness, colour, &c. and make it mix with the chyle, in order to reduce the several tastes, odours, and properties of the several foods into one homogeneous one.

Jansson ab Almeloveen will have the pancreatic juice to have been known to Hippocrates and Galen. De Graaf, a Dutch physician, has found means of collecting a quantity of it for experiments; and has published a treatise expressive, "De Succo Pancreatico."

Brunner relates, that the pancreatic duct, in several dogs, having been tied and cut, they still continued to eat and drink, and perform all the other functions of life as usual. One of them seemed only to have the better stomach for it.

PANCSOVA, in *Geography*, a town and fortrefs of Hungary, on the N. side of the Danube, in the bannat of Temesvar; 8 miles N. of Belgrade. N. lat. 45° 15'. E. long. 12° 16'.

PANCTOU, a town of Thibet; 70 miles N.N.E. of Lassa.

PANDA, a town on the N. coast of the island of Cumbava. S. lat 8° 27'. E. long 118° 48'.

PANDA, in *Mythology*, a goddess who was invoked and honoured as the protectress of travellers and navigators. The goddess of peace was also called Panda, because she opened the gates of cities which were shut in time of war. According to Varro, Panda is a surname of Ceres, derived à pane dando, because she gave bread to mankind. According to Arnobius, this goddess was so called because she opened the way to the capitol to T. Tatius.

PANDAIA, or PANTAIA, in *Geography*, a town on

the N. coast of the island of Cyprus, in a bay to which it gives name; 28 miles W. of Nicofia.

PANDALEON, in *Medicine*, a remedy appropriated to disorders of the breast and lungs, invented by the Arabians and later physicians; consisting of grateful ingredients answering the same end with the linctus, but different from it in form, in which it agrees with troches: it differs however in this, that troches are made in a certain figure, whereas the pandaleon, after the fugar is duly boiled, and the ingredients sufficiently mixed, is poured into a box, and becomes indurated, and a sufficient quantity is to be taken out either in a spoon, or on the point of a knife.

The pandaleon, therefore, is a solid medicine like a cake, receiving its form from the box into which it is poured: and it consists of powders, pectoral conserves, and lozenges of fugar.

PANDANEÆ, in *Botany*, a natural order of plants, recently established by Mr. R. Brown, Prodr. Nov. Holl. v. 1. 340, and so denominated from *Pandanus*; which see. The characters are thus given.

Flowers either diœcious or polygamous; destitute of a perianth.

Male, *Spadix* entirely covered with filaments, each bearing a single anther of two cells.

Female, *Spadix* entirely covered with gemens: mostly combined in parcels, each gemen of one cell, with a sessile clofely attached stigma. *Drupas* fibrous, mostly combined in parcels, each drupa with one seed; or else berries of several cells, with many seeds in each cell.

Albumen fleshy. *Embryo* central, erect. *Plumula* inconspicuous.

Trunk arboreous, but often sending down shoots to take root, and sometimes weak and decumbent. *Leaves* imbricated in three ranks, elongated, linear-lanceolate; clasping the stem, their edges most frequently spinous. *Floral leaves* smaller, often coloured.

This is a tropical family of plants, placed by its author near the *Aroidæ*, chiefly on account of the similarity of their inflorescence, the want of a perianth, the texture of the albumen, and the situation of the embryo; in all which characters it differs widely from the PALMÆ, see that article, resembling the latter only in having an arborefcent trunk.

A second genus, first observed by sir Joseph Banks, and lately most beautifully delineated by Mr. Ferdinand Bauer, during his stay at Norfolk island, differs from *Pandanus* in having a soft pulpy fruit, with several minute striated seeds in each cell, furnished at one side with a longitudinal appendage.

PANDANG, in *Geography*, a town on the W. coast of the island of Celebes. S. lat. 3° 33'. E. long. 120°.

PANDANG *Coëbin*, a town on the W. coast of the island of Sumatra. S. lat. 4° 36'. E. long. 102° 57'.

PANDANUS, in *Botany*, a name adopted by Linnæus from Rumphius, who fabricated it from the Malay *Pandang*, which signifies to behold, and which is supposed to allude either to the beauty of the tree in question, or to its conspicuous appearance at a distance. Whatever the meaning may be, the structure of the word is uncouth, and we cannot but regret that Forster's *Athrodactylis* was not retained; or if the genus must have a barbarous appellation, sanctioned by antiquity. *Kaida* of Rheede would surely have been preferable to the above. By the manuscript of the *Supplementum Plantarum*, it appears that the younger Linnæus, and not his father, is responsible for the name we presume to disapprove. Linn. Suppl. 64. Schreb. 670. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 387. Brown Prodr.

Nov. Holl. v. 1. 341. Juss. 444. Lamarck Illustr. t. 798. (Athrodactylis; Forst. Gen. t. 75.)—Class and order, *Diccia Monandria*. Nat. Ord. uncertain, Juss. *Pandaneæ*, Brown.

Gen. Ch. Male, *Cal.* Spadix compound, naked. Perianth none. *Cor.* none. *Stam.* Filaments scattered over the whole spadix, cylindrical; anther vertical, linear, acute, cloven at the base, of two cells, bursting longitudinally at one side.

Female, on a separate plant, *Cal.* none. *Cor.* none. *Pist.* Germens numerous, aggregate, sessile, tapering inwards, with five angles, convex at the summit, smooth; Style none; stigma two-lobed, bordered. *Peric.* Drupas aggregate, angular, fibrous, farinaceous. *Seed.* Nut bony, oval, smooth, its kernel inserted by the base into the centre of a *receptacle*, attached to the inner side of the shell.

Eff. Ch. Male, Calyx none. Corolla none. Spadix compound.

Female, Calyx none. Corolla none. Drupas aggregate.

1. *P. odoratissimus*. Linn. Suppl. 424. (Male, *P. verus*; Rumph. Amboin. v. 4. 139. t. 74; female, *P. spurius*; *ibid.* 142. t. 75. Kaida; Rheed. Hort. Malab. v. 2. 1. t. 1-6?)—Trunk throwing out runners. Drupas obovate at the summit—Native of the East Indies; cultivated there, as well as in many of the South Sea islands, and, according to Forskall, in Arabia, for the sake of its male flowers only, whose fragrance is said to be very delightful, and powerfully diffusive. The young plant is without any stem, and its long narrow pointed leaves, whose margins are serrated with spines, and whose under side is whitish and mealy, much resemble a *Bromelia*, to which genus Linnæus, in his Fl. Zeylanica, referred it. The floral-leaves are white, as well as the male flowers, which latter compose long, branched, dense spikes, in which nothing is discernible but innumerable filaments and anthers. The fruit, on a separate tree, resembles a Pine-apple, but is hard, dry, not eatable, nor of any use whatever. The cultivation of the female plant therefore is neglected. In an adult state the trunk is eight or nine feet high, much branched, sending down numerous long shoots from its lower part, which take root in the earth.

We are by no means competent to unravel all the varieties, or rather species, of this plant, described by Rumphius and Rheede, but which succeeding botanical travellers have left unexplained. Mr. R. Brown only has given definitions of the following two species, without any synonyms, and therefore we presume they are not supposed to be included among the above.

2. *P. pedunculatus*. Br. n. 1.—Trunk throwing out runners. Drupas conical and lobed at the summit; somewhat contracted at the base. Native of the tropical part of New Holland.

3. *P. spiralis*. Br. n. 2.—Trunk without runners. Drupas depressed and tessellated at the summit; very obtuse at the base.—Gathered likewise by Mr. Brown, in the same part of the world.

We have a specimen of a small, apparently distinct, species, gathered by Commerçon in the isle of Bourbon, and which he says grows also in Madagascar, and on the coast of Coromandel. In this the summit of each drupa is conical and acute, but we cannot judge how far the fruit is advanced towards maturity. The whole compound female spike is scarcely more than two inches long.

PANDANUS, in *Gardening*, contains a plant of the herbaceous, perennial, exotic kind for the stove, of which, the species is sweet-scented pandanus, or screw pine (*P. odoratissimus*).

Method of Culture.—This plant may be increased by sowing the seeds, brought from the places where it grows naturally, in pots of light earth, and plunging them in the bark-bed of the stove, where they must be constantly retained, having the management usually practised for other tender exotic plants.

They have a fine ornamental effect among other stove plants, in their large spreading foliage.

PANDECTS, PANDECTÆ, in *Jurisprudence*, the Digest, or collection made by Justinian's order, of five hundred and thirty-four decisions, or judgments of the ancient lawyers. on so many questions occurring in the civil law; to which that emperor gave the force and authority of law by an epistle prefixed to them. The jurisprudence of the Pandects is circumscribed within a period of one hundred years, from the perpetual edict to the death of Severus Alexander.

The word is Greek, Πανδεκταί, compounded of παν, all, and δεχομαι, capio, I take; q. d. a compilation, or a book containing all things. Though others, as Bartoli, will have it formed from παν, and δεχομαι; as if these books contained the whole doctrine of the law.

The Pandects consist of fifty books, and make the first part of the body of the CIVIL law; which see.

They were originally denoted by two π π; but the copyists taking those π π for ff, the custom arose of quoting them by ff. When the monuments of ancient Rome were neglected or destroyed by the envy or ignorance of the Greeks, the Pandects themselves escaped with difficulty and danger from the common shipwreck, and criticism has pronounced that all the editions and manuscripts of the west are derived from one original. It was transcribed at Constantinople in the beginning of the seventh century, and was successively transported by the accidents of war and commerce, to Amalphi, Pisa, and Florence, and is now deposited as a sacred relic in the ancient palace of the republic. The original at Constantinople was revered by Politian as the authentic standard of Justinian himself; but this paradox is refuted by the abbreviations of the Florentine MS. It is composed of two quarto volumes, with large margins, on a thin parchment, and the Latin characters betray the hand of a Greek scribe. The discovery of the Pandects at Amalphi (A.D. 1137) is first noticed (in 1501) by Ludovicus Bologninus, on the faith of a Pisan chronicle, without a name or a date. The whole story, though unknown to the 12th century, embellished by ignorant ages, and suspected by rigid criticism, is not, however, destitute of much internal probability. The Liber Pandectarum of Pisa, was undoubtedly consulted in the 14th century by the great Bartolus. Pisa was taken by the Florentines in the year 1406; and in 1411 the Pandects were transported to the capital. Gibbon's Hist. vol. viii. p. 44. 8vo.

Papias extends the denomination of Pandects to the Old and New Testament.

There are also *pandecta medicina*, *pandects of medicine*: these are a kind of dictionary of things relating to medicine, compiled by Mat. Sylvaticus, of Mantua, who lived about the year 1297. Leunclavius has published pandects of Turkey; and bishop Beveridge pandects of the canons, "Pandecta Canonum."

PANDEMON, Πανδημος, in *Antiquity*, the same with the festival Chalceia and Athenæa.

It was so called from the great concourse of people that used to meet at this solemnity.

PANDEMOS, in *Mythology*, a name given to *Venus*; which see.

PANDERLA, in *Geography*, a town of Hindooستان, in Madura; 30 miles N.N.E. of Coilpetta.

PANDIA,

PANDIA, Πανδία, in *Antiquity*, an Athenian festival in honour of Jupiter. For the origin of this solemnity, see Potter, *Archæol. Græc. lib. ii. cap. 20. tom. i. p. 422.*

PANDICULATION, PANDICULATIO, in a general sense, is a violent and tensive motion of the solids, which usually accompanies the act of yawning; and is otherwise called *stretching*.

PANDIPOUR, in *Geography*, a town of Hindoostan, in Oude; 22 miles S. of Fyzabad.

PANDOLY, a town of Hindoostan, in Baglana; 25 miles N.W. of Junera.

PANDONSER, a town of Hindoostan, in Dowlatabad; 20 miles E. of Poorundar.

PANDOO, a town of Hindoostan, in Visiapour; 20 miles N. of Sattarah.

PANDOOKAN, a small island in the Sooloo Archipelago. N. lat. $6^{\circ} 15'$. E. long. $120^{\circ} 34'$.

PANDORA, in *Mythology*, the name of the first woman, according to Hesiod; so called from παν, *all*, and δωρον, *gift*: because the gods united to confer upon her every quality and endowment that could conduce, as the fable says, to the misery of mankind. Pandora, it is farther said, kept these gifts in a vessel, the cover of which she opened, and they were dispersed over the face of the earth.

According to the fable, Jupiter, incensed at the conduct of Prometheus (see his article), ordered Vulcan to form a woman endued with all perfections, whence her name of Pandora originated. The gods loaded her with presents, and sent her to Prometheus with a box full of all kinds of misery. This prince, suspecting the trick, would have nothing to do with her; but Epimetheus, to whom she offered herself, was so captivated with her charms, that he took her to wife, and had by her Pyrrha, the wife of Deucalion. His curiosity, too, led him to look into the fatal box, which he no sooner had opened, than there issued out of it that deluge of miseries which have since overrun this earth. He shut it up again in haste, but all was gone but hope, which had not time to escape, and this, of consequence, is the only blessing that remains with wretched mortals.

PANDOSIA, in *Ancient Geography*, a town of Italy, in Brutium, upon the W. coast, near the sea, and the boundaries of Lucania. It was founded by the Ænetrians, who made it the capital of their territory. It was situated on a small mountain, at the foot of which ran a stream called "Acheron."—Also, a town of Epirus, in the interior of the country.

PANDROSOS, Πανδρόσος, in *Antiquity*, an Athenian festival in honour of Pandrosia, the third daughter of king Cecrops, who, not disobeying Minerva, was rewarded by the Greeks for her piety with a temple, built after her death, near that of the goddess, as Pausanias relates the story.

PANDSA TALA, in *Geography*, a group of several small lakes in Thibet. N. lat. $30^{\circ} 42'$. E. long. $79^{\circ} 26'$.

PANDU, in *Mythology*, the name of a personage of some importance in the heroic history of the Hindoos. He was the father of the five brothers or Pandavas, whose contests with the sons of Kuru form the subject of that splendid poem, the MAHABARAT, under which article the names and parentage of the Pandus, or Pandavas, and some other particulars of them, will be found. To these five heroes, it is usual in India to attribute the construction of any great work whose origin is lost in its antiquity. Such as the excavations on Elephanta, at Elora, &c.

PANDURA, or PANDORON, a musical instrument, used among the ancients, much resembling the lute.

The word, according to some, is formed from the Greek παν, and δωρον, *i. e.* all gifts, all sorts of gifts. Isidore de-

rives the name from its inventor Pandorus; others from Pan, to whom they attribute this invention, as well as that of the flute.

It has the same number of strings with the lute; but they are of brass, and of consequence give a more agreeable sound than those of the lute. Its frets are of copper, like those of the cistre; its back is flat, like that of the guitar; and the rims of its table, as well as its ribs, are cut in semi-circles.

Du-Cange observes, that Varro, Isidore, and others of the ancients, mention it as having only three strings; whence it is sometimes also spoken of under the denomination τριχορδον, *trichordum*.

The instrument called the Pandura or Bandoræ, of the lute kind, was very much in favour in our own country during the 17th century: but now, not only its scale, but even its form is forgotten. Julius Pollux relates that the Assyrians made use of an instrument with three strings, called the *Pandore*, or Pandarum, invented by the Arabians, and by them called the *trichord*. Pythagoras attributes this invention to the Troglodites, and pretends that this instrument was made of the water laurel.

PANDURIFORME, FOLIUM, in *Botany*, a leaf so named from its resemblance to the form of an ancient lyre, or πανδύρα, being rounded and dilated at each end with a contraction in the middle. The form of the modern violin seems to have been borrowed from that instrument, though it does not clearly appear for what reason. The leaf so denominated is scarcely to be found but in the species of *Rumex*, called from this resemblance, which is very correct and striking, Fiddle Dock. See LEAF.

PANDYSIA, Πανδυσία, in *Antiquity*, public rejoicings when the season, through its coldness and intemperance, forced the sailors to stay at home.

PANE', in *Geography*, a town on the N. coast of the island of Sumatra. N. lat. $2^{\circ} 40'$. E. long. $99^{\circ} 35'$.

PANEAS, a town of Syria, called also Casarea-Philippi (see CÆSAREA); 24 miles E. of Seir.

PANEGYRIC, PANEGYRIS, or *Panegyricus*, an oration in praise of some extraordinary thing, person, or virtue.

The name is Greek, πανηγυρις, formed of παν, *all*, and αγειν, *I assemble*; because anciently held in public and solemn assemblies of the Greeks, either at their games, their feasts, or their religious meetings.

The panegyric is ranked among the demonstrative kind of orations. See ORATION.

To make their panegyrics the more solemn, they used to begin with the praises of the deity in whose honour the games, &c. were celebrated; then they descended to the praise of the people or country where they were celebrated: then to the princes or magistrates who presided at them; and at length to the champions, especially the conquerors, who had gained the prizes in them.

F. De Colonia lays down two methods, or series, observed in panegyrics. The *artificial*, where, without any regard to the order of time, every thing is reduced to certain heads. Thus Tully refers the whole praise of Pompey to his skill in war, his virtue, authority, and felicity.

The other *natural*; in which the order and time of history are observed. This series he divides into three periods: the space before the person's birth; that wherein he lived; and, if he be dead, that which followeth his death. This natural series requires much less art, genius, &c. than the other.

The topics or sources of panegyric are, chiefly, the family and country of the hero, auguries at his birth, his vir-

tues, the talents of his body and mind, honours, riches, manner of his death, and the consequences thereof.

PANEGYRIC, πανηγυρικος, is also the name of a church-book in use among the Greeks: so called, as consisting of panegyrics, or discourses in praise of Jesus Christ, and the saints; it is found in MS. in most churches, but is not the same in all, each church having its particular saints; and the compilers of this kind of books usually suited their collections to the taste of their own devotion. They are disposed according to the order of months, and frequently consist of twelve volumes, answering to the twelve months of the year.

PANEGYRIS, Πανηγυρις, among the Greeks, a fair, or festival day, on which the people used to meet together. It exactly corresponded to the Nundinæ of the Romans.

PANEL, PANELLA, or *Panellum*, in *Law*, is derived, by Spelman, from *pagella*, a *schedule*, or *page*; in which sense we say, a *panel* of parchment, a *counterpanel* of an indenture, &c.

PANEL, or *Pannel*, is more commonly used for a schedule, or roll, containing the names of such jurors as the sheriff returns to pass upon any trial.

Hence the impanelling of a jury, is the entering of their names, by the sheriff, into a panel, or little schedule of parchment; called also the *panel of assize*, *panellum assise*. Coke on Littleton will have panel to be an English word, signifying a little part; as being a diminutive of the word *pane*, *part*; but Spelman takes this for an oversight.

PANEL, in *Joinery*, &c. See PANNEL.

PANEL, in *Ship-Building*. The captain's cabin and ward-room bulkheads consist of rails, stiles, and panels, framed together. The other cabins, of panels grooved and tongued together only.

PANELLENIA, Πανελληνισια, in *Antiquity*, a public festival, celebrated by an assembly of people from all parts of Greece.

PANEMUS, in *Chronology*, the Bœotian name of the Athenian month Metagitnion, which was the second of their year, and answered to the latter part of our July and beginning of August.

PANEMUS, among the Corinthians, answered to the Attic month Boedromion, or, according to Petavius, to our November. In the ancient Macedonian calendar, it was the ninth month of the year: but after the conquest of Arabia, they gave this name to the sixth month.

PANEPHYSIS, in *Ancient Geography*, a town of Egypt, and capital of a nome, called by Ptolemy "Neut."

PANERE, in *Geography*, a town of the island of Ceylon; 24 miles N.N.E. of Colombo.

PANEROS, the name of a beautiful stone dedicated to Venus; it was called also by some *pansebastos*, and was probably one of the beautiful azates.

PANES, in the *Ancient Theology*. See FAUNS.

PANETURE, in *Geography*, a town of the island of Ceylon; 18 miles S. of Colombo.

PANGA, a town on the E. coast of Celebes. S. lat. 1° 54'. E. long. 121° 16'.

PANGA, a town of France, in the department of the Moselle, and chief place of a canton, in the district of Metz. The place contains 232, and the canton 12,847 inhabitants, on a territory of 247½ kilometres, in 48 communes.

PANGÆUS MOUNTAINS, in *Ancient Geography*, a mountain of Thrace, on the confines of Macedonia, the foot of which was watered by the Nestus.

PANGASINAN, in *Geography*, a town on the W. coast of the island of Luzon, and capital of a province or kingdom. N. lat. 15° 40'.

PANGASMAN, a small island in the Sooloo Archipelago. N. lat. 6° 8'. E. long. 120° 58'.

PANGESANA, an island in the East Indian sea, about 45 miles long, and 9 broad, situated between the islands of Celebes and Boutan. S. lat. 5° 5'. E. long. 122° 50'.

PANGIMODOO, a small island in the South Pacific ocean, at the entrance of the harbour of Tongataboo.

PANGKER, a town of the duchy of Holstein; 3 miles N.N.W. of Lutkenborg.

PANGLO, or PANGLAO, one of the smaller Philippine islands; 60 miles N. of Mindanao.

PANGO, a town of Africa, capital of a province in the kingdom of Congo, on the Barbela; 40 miles N. of Congo Batta.

PANGOLIN, of Buffon, in *Zoology*, is the short-tailed manis, or MANIS *pentadactyla* of Linnæus; which see.

PANGONIA, in *Natural History*, the name of a genus of crystal.

The word is derived from the Greek πᾶς, *numerus*, and γωνία, *an angle*, or *bending*, and expresses a crystal composed of many angles.

The bodies of this genus are single-pointed, or imperfect crystals, composed of dodecangular, or twelve-plated columns, terminated by twelve-plated pyramids, and the whole body, therefore, made up of twenty-four planes. Of this genus there are only three known species.

PANGOOTARAN, in *Geography*, an island in the Sooloo Archipelago, about 10 miles long and 4 broad. N. lat. 6° 15'. E. long. 120° 28'.

PANGUCI, a small island in the East Indian sea, near the coast of Queda. N. lat. 5° 50'. E. long. 100° 5'.

PANGY, a town on the E. coast of the island of Celebes, in Gunong Tally bay. S. lat. 1° 6'. E. long. 120° 15'.

PANJAB, a province of Hindoostan, watered by the five branches of the Indus, frequently called *Lahore*, which see; though Panjab, being applied to a natural division of country, is applicable also to part of *Moulton*, which see. The five rivers from which Panjab derives its name, are Behut or Jhylum (the *Hydaspes* of Alexander), the Chunaub or Junaub (Alexander's *Acetines*), the Rauvee (Alexander's *Hydraotes*), the Beyah (Alexander's *Hyphasis*), and the Setlege, Suttuluz, or Sutluj. The sources of all these rivers are situated in the great chain of snowy mountains, that extend from Sirinagur to the north of Cashmere, and which are in fact the true *Imaus*, which see. The eastern boundary of the Panjab is properly, this ridge of mountains; but in a more limited sense, and particularly according to the ideas of the present times, the Panjab means the country situated *without*, or to the west of the hilly tract; and which is of considerable width, being possibly from 50 to 60 miles from the edge of the plains to the summits of the highest mountains. From the Setlege to the Jhylum, and to the hills that bound the Panjab, on the N. and E., it appears to be chiefly a tract of flat and very fertile land; and, indeed, the courses of the four eastern rivers very plainly indicate a regularity of surface and fertility of soil. But between the Jhylum or Behut and the Indus, there is a large proportion of hilly country, which may be supposed to influence the course of the Jhylum, and give it so different a form from the others; the river conforming to the border of the hilly tract. The Panjab country being the frontier province towards Tartary, and the northern parts of Persia, from whence have sprung the conquerors of Hindoostan in every age, Alexander excepted, their route to the interior parts of the country must have led through it. Nadir Shah's route was the ordinary one, by Attock and Lahore. For the other routes of Timur and Alexander, we refer to Rennell's memoir.

memoir. From these we learn that the lower part of the Panjab towards Moulton is flat and marshy, and inundated, like Bengal, by the periodical rains, which fall between the months of May and October. The revenues of this province, under Aurungzebe, amounted annually to 206½ lacks of rupees.

PANJANY, an island in the East Indian sea, near the coast of Siam, about 14 miles long, and 6 broad. N. lat. 8°. E. long. 98° 42'.—Also, a small island in the East Indian sea, near the east coast of the island of Borneo. N. lat. 2° 15'. E. long. 117° 59'.—Also, an island near the west coast of Siam, about 40 miles in circumference. N. lat. 8°. E. long. 98° 42'.—Also, a small island in the Pacific ocean, near the north coast of New Guinea. S. lat. 3° 18'. E. long. 135° 25'.

PANIANY, a town of Hindoostan, in Calicut; opposite to which is a passage through the Gaunts, about 16 miles wide, and 14 or 15 miles long, occupied by forest trees, and defended by the fort of Annamally on the E., and Paicaudcherry on the W., and opening finally into the low country on the Malabar coast; 42 miles S.S.E. from Calicut. N. lat. 10° 41' 45". W. long. 75° 55'. The river of Paniany takes its course from the Combettore country, through the above-mentioned opening; and is said to be navigable in the rainy season, for small boats, to the foot of the Gaunts. This circumstance, together with the inundated state of the country at that season, may serve to shew, that the country W. of the Gaunts has no great declivity, in a course of nearly 60 miles. This river, as well as that of Daraporum, has its source from an elevated plain, about 60 miles in extent, stretching itself across the eastern mouth of the gap or valley already mentioned. This plain rises suddenly from the level of the surrounding country, like a vast terrace; and the forest bounds it on the west.

PANJAPILLY, a town of Hindoostan, in Myfore; 13 miles W.S.W. of Caveripatam.

PANJASSAS, a town of Louisiana, on the Akanfas. N. lat. 36° 25'. W. long. 94° 21'.

PANIC, or PANIC Fear, a term used for a needless or ill-grounded fright.

Polyænus fetches the origin of the phrase from Pan, one of the captains of Bacchus, who, with a few men, put a numerous enemy to rout, by a noise which his soldiers raised in a rocky valley, favoured with a great number of echoes. This stratagem making their number appear much greater than it really was, the enemy quitted a very commodious encampment, and fled. Hence all ill-grounded fears have been called *panics*, or *panic fears*; and it was this that gave occasion to the fable of the nymph Echo's being beloved by the god Pan.

Others derive the origin of the expression hence; that, in the wars of the Titans against the gods, Pan was the first who struck terror into the hearts of the giants. Theon on Aratus says, he did it by the means of a sea-shell, which served him for a trumpet, of which he was the inventor. See PAN.

PANIC, in *Botany*. See PANICUM.

PANICASTRELLA, a sort of Italianized name, formed by Micheli from *Panicum*, for what is now the *Cenchrus* of Linnæus and other botanists, which Micheli perceived to be akin to that genus. There is certainly a resemblance in character, as well as in habit, to some of the numerous species which have been arranged under it. See PANICUM, and PENNISETUM.

PANICLE, in *Gardening*, is the part which shews the particular mode of flowering in some plants, and which is of

two sorts or descriptions, the one loose or diffuse, the other close or bound up. See PANICULA.

PANICOLO, in *Geography*, a town of Naples, in Lavora; 22 miles N.W. of Naples.

PANICULA, in *Botany*, is used by Pliny for the flowery tuft which crowns the summit of the reed, as well as for the male catkins of the fir tribe, whose dense scaly structure he very clearly mentions. Linnæus uses the word technically, according to the first meaning, for a particular kind of inflorescence, called in English a panicle. In this the flowers are disposed in a sort of loose subdivided bunch or cluster, without any order, as in the Common Reed, *Arundo Phragmites*, and the Oat. If the stalks are distant, as in the latter example, it constitutes a diffuse or lax panicle; if otherwise, a close or dense one. *Panicula sparsa*, implies a panicle whose branches spread every way; *secunda* is used when they are all turned to one side, usually in a drooping manner. The panicles of grasses are, for the most part, *semi-verticillata*, or half-whorled, their principal branches being disposed in a close ring, half round the main stalk. Very dense panicles are found in some of this family, as *Agrostis stolonifera*, the Fiorin grass, now so much talked of; *Panicum italicum*, the Millet; and especially the *Phleum paniculatum*, (see Engl. Bot. t. 1077.) whose inflorescence cannot be distinguished from a spike, till it is bent to one side, by which means it separates into lobes. Some plants have a forked panicle, so termed because a solitary flower is placed between each of its ramifications, as in various species of *Silene*, *Spergula*, &c. A remarkably divaricated, or rigidly spreading, panicle is seen in the Wall Lettuce, *Prenanthes muralis*. The sugar-cane, when it blossoms, which most West Indians will tell us never happens, but which the writer of this has seen with admiration, bears one of the largest and most elegant panicles in nature. The distinction between a panicle and a spike is in all cases very great, but particularly important in the natural family of grasses, where it separates most of the genera into two grand sections—A very compact panicle is, in some instances, termed a THYRSUS; see that article.

PANICUM, an old Latin name for the most celebrated species of the genus, *P. italicum*, and which Faber and Ambrosinus, after Pliny, declare to allude to its panicle of seed. Certainly the inflorescence of that grass, or corn, though now termed a spike, answers peculiarly well to the classical idea of a panicle. (See PANICULA.) Other etymologists deduce the word *Panicum* from *panis*, *bread*; for which, however, it seems to have served less than many other sorts of grain. Linn. Gen. 32. Schreb. 46. Willd. Sp. Pl. v. 1. 333. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 64. Prodr. Fl. Græc. Sibth. v. 1. 39. Ait. Hort. Kew. ed. 2. v. 1. 139. Brown Prodr. Nov. Holl. v. 1. 189. Swartz. Ind. Occ. 139—178. Juss. 29. Lamarek Illustr. t. 43. Michaux Boreal-Amer. v. 1. 46. Gært. t. 1. (Digitaria; Juss. 29.)—Class and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. reformed. *Cal.* Glume of two flowers, and two, nearly ovate, ribbed valves; the outermost minute and somewhat inferior; one floret perfect, the other either neuter or male. *Cor.* of the perfect floret a glume of two nearly ovate cartilaginous valves; the outermost convex, embracing with its margins the inner one, which is smaller and flatter; that of the neuter or male, often very small, a glume of two valves; the outermost, in the bosom of the smaller valve of the calyx, flattish and ribbed; the innermost membranous, flat, with inflexed margins. Nectary, in the perfect as well as male florets, minute, gibbous, of two leaves; in the neuter wanting. *Stam.* in the perfect and male florets

PANICUM.

florets only; filaments three, capillary; anthers oblong. *Pist.* in the perfect florets only, germen roundish; styles two, capillary; stigmas feathery. *Peric.* none, except the corolla closely combined with the seed. *Seed* solitary, clothed with the corolla, roundish, flattened at one side.

Ess. Ch. Calyx of two very unequal valves, containing two flowers, the outer one male or neuter. Corolla of two unequal valves, finally cartilaginous, and investing the seed.

Obf. Schreber remarks, that botanists, having overlooked the inner glume of the imperfect floret, conceived its outer glume to belong to the calyx; hence the latter was thought to consist of three valves, of which the third was much the least. We plead guilty to this charge, but have never been satisfied with the opinion we adopted. The inner valve of the imperfect floret, discovered by Dr. Stokes and Mr. Sowerby in *P. Crus-galli*, is figured in *Engl. Bot.* t. 876; and though we agreed to refer it, as a fourth valve, to the calyx, this was, in reality, because we could dispose no otherwise of the troublesome intruder. Mr. Brown has adopted the ideas of Mieg, Adanson, Forskall, and Schreber, on this subject, and we have profited by their corrections of the Linnæan characters. It is necessary to observe, however, that the neutral floret very generally consists of but one valve, so that the above error might easily be committed.—Our learned friend, in his *Prodr. Nov. Holl.* v. 1. 193—195, has established three new genera as distinct from *Panicum*, which we scruple to adopt. These are, 1st, *Chamaraphis*, distinguished only by having three styles instead of two, and consisting of but one species; 2d, *Orthopogon*, which has nearly equal calyx-valves, as well as smooth awns, and consists of *P. compositum* and *birtellum*, with a few new species; 3d, *Pennisetum* of Richard, comprising *P. viride*, *verticillatum*, *glaucum*, *helvolum*, *italicum*, with a new species called by Mr. Brown *compressum*, all which have a partial involucre, composed of separate bristles, including one or three flowers. The genus of *Panicum* is indeed overburdened with species, but above all things we hesitate to admit *Pennisetum*, as its character is taken rather from a part of the inflorescence than of the flower, and as it embraces the original *Panicum* of the ancients, from whence, and its allies, all botanists have taken their ideas, in general, of the genus in question. We perceive, moreover, in *P. Crus corvi*, *Crus galli*, &c. something of an approach to a similar bristly involucre.

Panicum consists of thirty-four species only, in Linn. *Syst. Veg.* ed. 14. Willdenow has eighty, having profited much by the labours of Retzius and Swartz, the former of whom has described many new species from the East, and the latter a considerable number from the West Indies. The new edition of *Art. Hort. Kew.* contains twenty-five species, all among those of Willdenow. Five of them are natives of England. One new species only is defined in the *Prodr. Fl. Græc. Sibth.*

The whole are distributed by Linnæus, and consequently by Willdenow, into two sections, *flowers spiked*, and *flowers panicled*. The author last named has forty species in each section. Mr. Brown, however, who has defined thirty-two new species of *Panicum*, even as he limits the genus, from New Holland alone; besides five other new ones referred to his genera of which we have spoken above; has divided *Panicum*, upon new principles, into seven sections.

Of these, for want of knowing his new species, we can form no conclusive judgment; and we shall therefore content ourselves with the old arrangement, selecting a few examples, that may indicate certain subdivisions of the sections, or

assemblages of species, so as to give a comprehensive idea of the whole, with the characters of the most remarkable.

SECT. 1. Flowers spiked.

Here at first nine species present themselves, which belong to Mr. Brown's *Pennisetum*, and of which two are British.

P. verticillatum. Rough Panick-grass. Linn. *Sp. Pl.* 82. Willd. n. 3. Curt. *Lond. fasc.* 4. t. 6. *Engl. Bot.* t. 874. (*Gramen geniculatum*; Ger. em. 15. f. 1.)—Spike whorled; spikelets in fours. Involucre of two bristles, rough, with reversed teeth to each flower.—Native of the warmer parts of Europe, in cultivated ground, especially where the situation is rather moist, but rare in England, chiefly occurring in Battersea fields and that neighbourhood. We have found it on the west side of Norwich, in gravelly fallow fields, flowering in July or August. The root is annual, fibrous. Stems straight, but widely spreading, leafy, rough above. Leaves harsh, straight, pointed, dark green, very rough at the edges; their *stipula* fringed. Spikes solitary, terminal, erect, green, with a purplish tinge, composed of many dense whorled spikelets. The bristles which compose the involucre, being rough with teeth that point backwards, afford the most certain mark of distinction, first pointed out by the ingenious Mr. Curtis, between this and *P. viride*. Both these are harsh useless grasses, not abundant enough to be known to the farmer as noxious weeds.

P. viride. Green Panick-grass. Linn. *Sp. Pl.* 83. Curt. *Lond. fasc.* 4. t. 5. *Engl. Bot.* t. 875. Knapp, t. 10. *Leerf.* 13. t. 2. f. 2. (*G. panicis effigie spicâ simplici*; Ger. em. 17.)—Spike cylindrical; spikelets crowded. Involucre of several bristles, rough, with erect teeth, and embracing two flowers.—Native of the warmer parts of Europe, rather less rare in England than the former, and usually found in more dry sandy ground. It is annual, flowering at the same time with the *verticillatum*, and, as far as we know, equally unprofitable to the agriculturist. Small birds however are fond of the seeds of both species. The spikelets in the present are irregularly crowded, not whorled. Flowers generally in pairs, with about six bristles, which are rough with teeth that point forwards or upwards, a clear and decisive character. The same difference is observable in the direction of the minute bristly teeth which form the roughness of the upper part of the stem in each species. These marks were, nevertheless, unknown to Linnæus, nor were his ideas clear concerning the two grasses in question.

P. glaucum. Glaucous Panick-grass. Linn. *Sp. Pl.* 83. Willd. n. 5. Schreb. *Gram.* 21. t. 25. *Leerf.* 12. t. 2. f. 2. †. (*Pennisetum glaucum*; Brown *Prodr. Nov. Holl.* v. 1. 195.)—Spike cylindrical; spikelets crowded. Involucre of many bristles, rough, with erect teeth, and usually embracing two flowers. Case of the seed transversely wrinkled.—Native of the south of Europe, as well as of America, the East Indies, and New Holland, being one of the most general of grasses, though not found wild in England. Its habit is like the two former, but the stems are taller and more erect; the herbage rather glaucous; the numerous bristles of the involucre with a tawny or golden tinge, not purple; and the outer glume of the perfect floret curiously marked, in its upper part, with transverse wavy wrinkles. The upper part of the stem is strongly furrowed, but not rough to the touch.

P. italicum. Italian, or True, Panick-grass. Linn. *Sp. Pl.* 83. Willd. n. 8. Bauh. *Theatr.* 519. (*Panicum*; Matth. *Valgr.* v. 1. 368. Rumph. *Amboin.* v. 5. 202. t. 75. f. 2.)—Spike compound, drooping; interrupted at the

PANICUM.

the base; spikelets clustered. Involucrum of many, very long, rough bristles. Common stalk woolly.—Native of both Indies. Cultivated in Italy and other parts of Europe. This is believed to be the true *Panicum* of the ancients, and its drooping panicle is described by Pliny, who speaks of it as not so much used as the Millet, *P. miliaceum*, in making bread, but weighing more than any other grain, as well as increasing more in bulk when cooked. It is annual, with the habit of the foregoing, but much larger, the root producing several stems, four or five feet high, with broad harsh leaves, and a solitary, very heavy, dense spike, or rather condensed panicle, bent downwards, beset with innumerable very long bristles, and producing abundance of small oval smooth seeds, not bigger than those of *P. glaucum*.

P. germanicum, Willd. n. 7, seems to us but a starved variety, or perhaps the true wild state, of the *italicum*.

After this tribe follows a train of species, with rather distantly branched compound spikes, which Mr. Brown considers as properly belonging to *Panicum*. We cannot but concur with him in the union of three supposed species, under the following.

P. Crus galli. Loose Panick-grafs. Linn. Sp. Pl. 83. Curt. Lond. fasc. 4. t. 8. Engl. Bot. t. 876. Knapp. t. 11. Leers. 13. t. 2. f. 3. (*P. Crus corvi*; Linn. Sp. Pl. 84. *P. flagginum*; Retz. Obs. fasc. 5. 17.)—Spike twice compound; its branches angular, rough and bristly, alternate or in pairs. Calyx angular, hispid, awned.—Native of Europe, North America, the East Indies, and New Holland, in cultivated or waste land, that is either moist or inundated. With us it is rare, flowering in July. This is a coarse annual grass, two feet or more in height. Leaves broad, harsh, with long tumid sheaths, and either no stipula, or only a few hairs in the place of one. The common spike is four or five inches long, with a five-angled, rough and furrowed, common stalk, and from six to ten alternate branches, distant below, crowded into the top of the spike above. The branches are also slightly compound. Flowers crowded, all turned to one side, hispid or prickly, accompanied by scattered tufts of rather distant, fine, smooth, pellucid bristles, about as long as the flowers. The outer valve of the neuter *floret* is hispid, and awned or pointed, like the valves of the calyx, of the nature of which it participates throughout the genus; the rest are smooth, that which invests the seed even and polished.

P. brizoides. Briza-like Panick-grafs. Linn. Mant. 184. Willd. n. 17. Ait. n. 10. (*Gramen panicum, multiplici spicâ maderaspatanum*; Pluk. Phyt. t. 191. f. 1.)—Spike compound; its branches alternate, erect, oblong. Flowers crowded, turned to one side, without awns. Stem simple, smooth.—Native of the East Indies. A smooth pale grass, whose stem is simple, or rarely branched; the leaves long, loosely spreading, smooth and naked. Spike terminal, straight, composed of several alternate, oblong, obtuse branches, of crowded whitish-green flowers, all turned to one side. The outer *glumes* are ovate, tumid, with hairy ribs, the inner one which invests the seed very smooth and shining.

P. eruciforme. Caterpillar Panick-grafs. Sm. Fl. Græc. Sibth. v. 1. 44. t. 59.—Spike compound; its branches alternate, erect, close-pressed, linear, hairy. Flowers crowded, turned to one side, without awns. Stem branched from the bottom.—Discovered by Dr. Sibthorp in fields about the temple of Juno, in the island of Samos. Differs from the last in having a slender hairy stem, branched from the bottom, with numerous bent joints; leaves short and spreading; branches of the spike more slender, linear, and hairy; *glumes*

less tumid, and the outermost valve of the calyx much more minute.

This tribe, including several more species, is followed by such as constitute the genus *ORTHOPOGON* of Mr. Brown, (see that article,) who indicates six species, *P. Burmanni*, Willd. n. 20; *hirtellum* and *compositum*, Linn. with three new ones named by him *Orthopogon æmulus, flaccidus* and *imbricellus*, the four last being found in New Holland. One example is sufficient.

P. hirtellum. Rough-haired Panick-grafs, called in the West Indies Scotch-grafs. Linn. Sp. Pl. 83. Willd. n. 21. Ait. n. 1. Hofst. Gram. Austr. v. 3. 36. t. 52.—Spike compound; its branches alternate, close-pressed. Flowers smooth, in pairs, turned to one side. Calyx with long, smooth, channelled awns. Leaves ovate, pointed.—Native of the West Indies, as well as of the south of Europe. Root biennial. Stems branched, decumbent, taking root at the joints, two or three feet long. Leaves spreading, ovate, pointed, varying in breadth, ribbed, rough, besprinkled with soft hairs; their sheaths extremely hairy, particularly at the top and bottom. Spikes terminal, conspicuous for the prominent purplish awns of the calyx, which are linear, obtuse, quite smooth, flattened or channelled above, three quarters of an inch long. The corolla has similar, but much shorter, awns. The common stalk is winged and hairy.

A tribe with fingered spikes, the *Digitaria* of Haller and Jusseu, succeeds. The differences in the number of the calyx-valves in different species, or their variableness in the same, have caused a diversity of sentiments among botanists. The genus *Cynodon*, Brown Prodr. Nov. Holl. v. 1. 187, is formed out of this tribe. Their habit, especially their long, linear, clustered, but divaricated, spikes, give them an aspect very distinct from all the species we have hitherto mentioned.

P. sanguinale. Cocks-foot Panick-grafs. Linn. Sp. Pl. 84. Willd. n. 28. Ait. n. 12. Curt. Lond. fasc. 4. t. 7. Engl. Bot. t. 849. Knapp. t. 12. Schreb. Gram. v. 1. 119. t. 16. Hofst. Gram. Austr. v. 2. 14. t. 17. Mart. Rust. t. 78. (*Ischæmon vulgare*; Ger. em. 27)—Spikes fingered; knotty on the inside at the base. Flowers in pairs, awnless. Sheaths of the leaves dotted.—Native of various parts of Europe, as well as of America; rare in England. It is annual, flowering in July, and prefers a rich moist soil. The stems are numerous, bent and decumbent at their base, spreading widely upwards, twelve or eighteen inches long, smooth, rigid, leafy. Leaves linear-lanceolate, broad, nearly smooth, generally shorter than their sheaths, which are striated, and besprinkled with small cartilaginous dots or tubercles, frequently producing fine hairs. Spikes about four or five, spreading, two inches or more in length, nearly umbellate, or at least approximated, linear, the common stalk of each zigzag, winged, tumid at the bottom. Flowers dull violet, in alternate pairs leaning one way, on unequal short partial stalks. Outer valve of the calyx very minute, and often abortive. This is a hard coarse grass, of no agricultural use.

P. dactylon. Creeping Panick-grafs. Linn. Sp. Pl. 85. With. 116. t. 21. Engl. Bot. t. 850. Knapp. t. 13. Sm. Fl. Græc. Sibth. v. 1. 45. t. 60. (*Cynodon Dactylon*; Brown Prodr. Nov. Holl. v. 1. 187.)—Spikes fingered; hairy on the inside at the base. Flowers solitary. Calyx equal to the corolla. Shoots creeping. Leaves pungent.—Native of the sandy shores of Cornwall, as well as of the south of Europe, the Levant, the East Indies, and New South Wales. In the north of Italy it is common in the

PANICUM.

the streets of many towns, and flowers at various seasons. The strong perennial *roots*, with smooth fibres, are formed of hard polished runners, shooting horizontally to a great extent in the sand, and clothed with the permanent sheathing bases of the rigid, pungent, glaucous, hairy *leaves*. Flowering *stems* a span high, more or less, leafy. *Spikes* from three to five, shorter than in the last, their common stalks zigzag and angular, but not winged. *Flowers* solitary, alternate, close-pressed, at one side only. *Calyx* of two nearly equal lanceolate valves, almost as long as the *corolla*, which is compressed, polished and beardless. Mr. Brown notices the rudiment of a second *floret*, in the form of a naked bristle, at the base of the inner valve of the *corolla*. This grass was perceived by Mr. Lambert, Tr. of Linn. Soc. v. 7. 309, to be no other than the *Agrostis linearis* of Koenig, Retzius, and Willdenow, Sp. Pl. v. 1. 375, the *Durva* of the Hindoos, which the late Sir William Jones, in the 4th volume of the Asiatic Researches, has celebrated for the extraordinary beauty of its flowers, and its sweetness and nutritious quality as pasture for cattle. We cannot but remark what extraordinary celebrity is attached, every now and then, to one grass or other, and how their fame passes away "like the morning cloud," while the best graziers scarcely know perhaps, better than their fat cattle, any thing of the nature of the common never-failing herbage, to which they are both so much indebted. It is but justice however to the memory of the great Sir William Jones, to mention, that the very *Panicum* in question appears to be, as Dr. Sibthorp judged, the real *αγρωστής* of Dioscorides, which that ancient botanist describes as having "jointed creeping shoots, throwing out sweet roots from their joints; and pointed, hard, broad leaves, like a small kind of reed, which are the food of cattle." This description is very characteristic; and the grass is called by the modern Greeks, on all whose coasts it abounds, either *αγρωστόν* or *αγρωστάδα*.

Section 2. *Flowers paniced.*

P. repens. Paniced Creeping Panick-grass. Linn. Sp. Pl. 87. Willd. n. 45. Ait. n. 18. Sm. Fl. Græc. Sibth. v. 1. 45. t. 61. Cavan. Ic. v. 2. 6. t. 110.—Panicle with stiff upright branches. Leaves divaricated. Root creeping.—Native of the banks of rivers in the Levant; gathered by Dr. Sibthorp near Platania in Crete, flowering in June; by Mr. Schlanbusch about 30 miles south of Naples; and by Broussonet and Desfontaines at Algiers. It is said in Hort. Kew. to be cultivated in the East Indies. The *root* is perennial, creeping to a very great extent, and by no means annual. It throws out copious fibres from its joints, and many ascending *stems*, twelve or eighteen inches high, simple, smooth, clothed with numerous, spreading, rather stiff *leaves*, whose margins and long sheaths are fringed with hairs, but their under side is very smooth to the touch. *Panicles* terminal, rather close, of numerous, upright, zigzag, rough-edged, repeatedly subdivided, slender branches; bearing a number of solitary, upright, smooth *flowers*. The *glumes* are ovate, tumid, ribbed. *Anthers* yellow. *Stigmas* purple, beautifully feathered, cylindrical. We are not informed whether the grain or the herbage be the object of culture in this plant.

P. miliaceum. Millet Panick-grass, or true Millet seed. Linn. Sp. Pl. 86. Willd. n. 49. Ait. n. 19. Hoff Gram. Austr. v. 2. 16. t. 20. (Miliun; Matth. Valgr. v. 1. 367. M. femine luteo vel albo; Bauh. Theatr. 502.)—Panicle loose and flaccid. Sheaths of the leaves hairy. Glumes pointed, ribbed.—Native of the East Indies. Cultivated from time immemorial in the south of Europe for the

fake of its seeds, which are among the more delicate, though not the most nutritious, kinds of grain. Small birds are very fond of these seeds, and the crop therefore requires strict vigilance while ripening. It is sown in the spring. The *root* is annual. *Stem* four or five feet high. *Leaves* pale, broadish; their sheaths ribbed, dotted, clothed with long, spreading or deflexed, hairs. *Panicle* terminal, lax and spreading, of innumerable, slender, compound, angular, rough-edged branches. *Flowers* larger than in the last, tumid, smooth, ribbed, awnless, a little drooping. Covering of the *seed* exquisitely polished.

P. latifolium. Broad-leaved American Panick-grass. Linn. Sp. Pl. 86. Willd. n. 62. Ait. n. 21. (Miliun virginianum lato brevique folio; Morif. sect. 8. t. 5. f. 4.)—Lateral branches of the panicle simply racemose. Leaves ovato-lanceolate, finely fringed at the base. Outer glumes obtuse, strongly furrowed, hairy.—Native of North America, from whence Kalm sent it to Linnæus. This is perennial and hardy in our climate, flowering late in autumn. The very broad *leaves*, almost heart-shaped at their base, where they are finely and densely fringed, mark this species; their sheaths are tight and smooth. *Panicle* wavy, loosely spreading, its branches angular, but scarcely rough; the lateral ones, for the most part, simply racemose, with distant *flowers*, on slender stalks of various lengths. The *glumes* are turgid, ovate, obtuse; the outer ones very strongly ribbed and furrowed, clothed with short hairs; the inner highly polished, and perfectly even.

P. oryzoides. Rice-like Panick-grass. Swartz Ind. Oec. 162. Willd. n. 65. (Miliun indicum arundinaceo caule; Sloane Jam. v. 1. 104.)—Panicle nearly simple, erect. Leaves ovato-lanceolate; their sheaths finely fringed at the summit. Glumes acute, all smooth and even; the outer ones obscurely ribbed.—Native of mountainous shady places, in the south of Jamaica, according to Dr. Swartz, whose obscure reference to Sloane leads us to suppose this is the plant the latter intended under the above name, which he says is "planted every where in Jamaica, yielding very great increase. It is thought to nourish little, and to be astringent as rice." Linnæus, who had a specimen from Browne's herbarium, confounded it, at the suggestion of Solander, with *latifolium*, from which the present species widely differs, in having *flowers* three times as large, with perfectly smooth, even, pointed glumes.

P. clandestinum. Sheath-flowered Panick-grass. Linn. Sp. Pl. 86, excluding the synonym. Willd. n. 66.—Panicles simple, concealed in the hairy sheaths of the heart-shaped leaves.—Native of Pennsylvania, from whence Kalm communicated it to Linnæus. The latter greatly errs in quoting a synonym of Sloane, which evidently belongs to his own *Cenchrus granularis*. We can indeed find no figure of the present species, nor have we seen it but in the Linnæan herbarium. The *stem* is very much branched, round, purplish, smooth and polished. *Leaves* about three inches long and one broad, alternate, spreading, heart-shaped and minutely crenate at the base, flat, tapering gradually into a sharp point; smooth on both sides, finely striated, paler beneath; *sheaths* nearly as long as the leaves, rather inflated, ribbed, besprinkled with cartilaginous umbilicated tubercles, as in *P. sanguinale*, many of which bear horizontally prominent brittle hairs. Within the sheaths of several of the uppermost *leaves* are completely concealed solitary, simple *panicles*, or rather clusters, of but few *flowers*, whose outer glumes are ribbed, ovate, obtuse and awnless, scarcely hairy or downy. The *glumes* do indeed greatly resemble those of *P. latifolium*, to which Linnæus considers this plant nearly allied.

allied. The sheaths of the *leaves* however, as well as the *inflorescence*, are very unlike that species.

P. arborefcens. Tree Panick-grafs. Linn. Sp. Pl. 87. Willd. n. 67. Ait. n. 22.—Stem arborefcent, very much branched, fmoth. Leaves heart-shaped-oblong, crenate, fomewhat fringed, with fmoth fheaths. Panicles capillary, level-topped, many-flowered. Glumes elliptical; the outer ones ribbed.—Native of the East Indies. Said to have been fent to Kew garden in 1776, by M. Thouin; flowering in the ftove in March and April. We know neither figure nor defcription of this, except that Linnæus fays it vies in height with the moft lofty trees, though the *flem* is fcarcely thicker than a goofe-quill. That part, in his fpecimens, is very much branched and divaricated, round, fmoth, highly polished, fender, but hard and rigid, with many knotty joints, and hard fealy buds, from whence the copious lateral fhots are produced. The *leaves* are lanceolate, pointed, three or four inches long, fcarcely one broad; ovate at the bafe, but much contracted, almoft into a fhort footftalk, before they join the fheaths, as well as very hairy there at the back, though otherwife naked, or merely roughift to the touch. The *fheaths* are tight, hard, fmoth and polished, crowned with a tuft of briftles. In the younger or flowering branches, the *leaves* are larger, with lefs elongation of the contracted part at their bafe. *Panicles* terminal, on long ftalks, with repeatedly fubdivided, long, capillary, fmoth-ift, level-topped branches, bearing numerous, fmall, upright, folitary *flowers*, whose glumes are elliptical and naked; the outer ones ribbed; that which enclofes the feed highly polished. We are not certain of our two Linnæan fpecimens belonging to the fame fpecies, as only one of them has *flowers*, and the *leaves* differ as above mentioned, as well as in being more harfh, with larger ftipulaceous briftles, in the barren fpecimen. The younger *branches* moreover are ftriated, and not fo finely polished. Both however are marked, and confidered as the fame, by Linnæus.

P. divaricatum. Straddling Panick-grafs. Linn. Sp. Pl. 86. Willd. n. 80. Ait. n. 25. Jacq. Hort. Schoenbr. v. 1. 10. t. 25.—Stem arborefcent, very much branched, divaricated, fmoth. Leaves linear-lanceolate, entire, with fmoth fheaths. Panicles rigid, compound, divaricated. Glumes obovate, tumid; the outer ones ribbed.—Native of Jamaica; flowering in our ftoves in fummer. The *flem* agrees in habit with the laft, and is perennial, climbing apparently to a great height if it meets with fupport; the branches copious, fpreading, leafy, round, fmoth and polished. *Leaves* about three inches long, and half an inch wide, lanceolate, acute, ftriated, fmoth, except at the edges, dark green; their *fheaths* much fhorter than the leaves, ribbed, naked, a little fwelling; each crowned with a fhort, membranous, fringed *ftipula*. *Panicles* terminal, erect, twice compound, with alternate, divaricated, rigid, angular, zigzag branches, roughift at the edges. *Flowers* five times as big as the laft and much fewer, being the fize of a grain of wheat, bent to one fide, obovate, polished; their outer glumes ribbed. Sometimes the glumes all affume a black or dark purple colour.

We have received from M. Delile, a celebrated French botanift and traveller, many fpecimens of this genus which appear to be nondefcript. Of thefe fome are the produce of North America, others of Egypt, and feveral of them very curious. They may probably have been published at Paris, fince the fpecimens reached us, and therefore we fhall not venture on their particular determination here. Michaux has alfo many fpecies unknown to us. All thefe, added to the New Holland ones of Mr. Brown above-men-

tioned, will perhaps extend the fpecies of *Panicum* to about 130 in all.

PANICUM, in *Agriculture*, a genus of grafes of which there are feveral fpecies, but none of which can be cultivated, except for bird-feed.

PANIEFOULE, in *Geography*, a lake of Africa, in Hoval, which communicates with the Senegal. N. lat. 16° 40'.

PANIGAROLA, JEROME, in *Biography*, an Italian prelate, and one of the moft celebrated preachers in the fixteenth century, was born at Milan, of a noble family, in 1548. At a very early age he difcovered great genius and abilities, and befides an uncommon facility in acquiring knowledge, he poffeffed furprifing powers of memory, which enabled him to retain whatever he learned. Being fent to the univerfity at Pavia he diftinguifhed himfelf in a few months by the rapidity of his progreffs in learning, though it was, at the fame time, a matter of great regret, that he rendered himfelf notorious for his irregularities and turbulent fpirit. No difturbance ever occurred in the univerfity, but Panigarola would be found deeply concerned in it; and fcarcely a night paffed, in which, at the head of pupils from Milan, he was not engaged in quarrels and battles with the ftudents from Placentia, Pavia, or fome other place. At length his exceffes became fo great, that the fenate of Milan ordered his father to withdraw him from Pavia. He was now fent to Bologna, where, for fome time, he rendered himfelf equally notorious for his ill conduct, and for the licentious example which he gave to his contemporaries. Suddenly an entire change took place in his mind, and he expreffed a ftrong inclination for embracing the monaftic life. He accordingly took the habit of St. Francis at Florence in 1567, when he was only nineteen years of age. His whole delight now confifted in the moft regular and punctual obfervance of the duties of the cloifter, and in affiduous ftudy. In the year 1570, the perfon appointed to preach the Lent fermons was fuddenly taken ill, and Panigarola was appointed his fubftitute. The difplay of his eloquence on this occafion obtained for him the higheft reputation. From this moment, wherever he appeared in the pulpit admiring crowds of all ranks attended. Pope Pius V. heard him, and was aftonifhed; but thinking that fo young a man flood in need of a more perfect acquaintance with the facred fcriptures, and the fathers, than it was poffible he could have acquired fo foon, recommended it to him to devote fome time to clofe ftudy. He accordingly went to France for this purpofe, and attended the profefors at the univerfity of Paris. Upon his return to Italy his celebrity was fo great, that there was no church fufficiently large to accommodate the crowds who were attracted by his preaching, and when he was upon a journey, he could fcarcely pafs through any city or town, without being, in a manner, compelled to preach. In 1586 he was confecrated at Rome titular bifhop of Chryfopolis, and appointed coadjutor to the bifhop of Ferrara; but in lefs than three months he received an order to quit Ferrara, and the duchy, a difgrace which he attributed to the intrigues of a minifter jealous of his renown, who perfuaded the duke that he betrayed the fecrets of the ftate to cardinal Ferdinand de Medici. Under thefe circumftances he was received with great kindnefs by pope Sixtus V. who appointed him to preach at St. Peter's in the year 1587. In 1589 he was fent by the fame pontiff into France to encourage the party of the league againft Henry IV. He was prefent at the fiege of Paris, and employed all his eloquence in animating the citizens to fubmit cheerfully to the priva-

tions and miseries which they suffered during the memorable blockade of that place. He died in 1594, at the early age of forty-six. As an author, his most celebrated productions consist of several volumes of sermons, in Latin and Italian: besides these he published many other theological pieces, theses, orations, and poems; also "Paraphrasi sopra Demetrio Falerio, &c." consisting of a learned commentary upon the treatise of Demetrius Phalereus on eloquence. Moreri.

PANIGENA, in *Ancient Geography*, a town on this side of the Ganges, and on a gulf of this river, between Paluga and Conagera. Ptolemy.

PANIONIA, Πανωνία, in *Antiquity*, a festival in honour of Neptune, celebrated by a concourse of people from all the cities of Ionia.

One thing is remarkable in this festival, that if the bull offered in sacrifice happened to bellow, it was accounted an omen of divine favour; because that sound was thought to be acceptable to Neptune.

PANIS, in *Geography*, an island in the Atlantic, at the mouth of the river Bandi, near the coast of Africa. N. lat. 5°.

PANIS, a tribe of Indians, 120 miles from the mouth of the river Platta, or Shallow river, a western branch of the Missouri. This tribe numbers 700 warriors, in four neighbouring villages. They hunt but little, and have few firearms. They are often at war with the Spaniards in the vicinity of St. Fé, near which is the place of their abode.

PANIS & *cerevisia affisa*, in *Law*. See ASSISA.

PANIS & *cerevisia emendatio*. See EMENDATIO.

PANIS Demonum, in *Natural History*, a name given by authors to a sort of coarse stone, common in Sweden, and some other places, and usually found in roundish, but somewhat flattened masses, resembling a loaf in form.

PANIUM, in *Ancient Geography*, a promontory of Europe, on the coast of the Thracian Bosphorus.

PANIUS, or PANEUS, a mountain of Syria, which formed part of mount Libanus, and at the foot of which was situated the town of Paneus.

PANKE, in *Botany*, a name, as we presume, of American origin, published by Feuillée, and adopted by Molina, though the latter has transferred it from the original plant of Feuillée, which is a *Gunnera*, to a totally distinct genus, termed by that author *Llaupanke*. Willdenow has retained this name, and thus it has found a place in a popular work, which we greatly lament, the word being, according to every sound principle, inadmissible.—Molin. Chil. (the German edition according to Willd.) 119. Willd. Sp. Pl. v. 2. 486.—Class and order, *Enneandria Monogynia*. Nat. Ord. near *Bocconia*?

Ess. Ch. Calyx four-cleft. Corolla bell-shaped, four-cleft. Capsule of two valves, with one seed.

1. *P. tinctoria*.—"Leaves stalked, five-lobed."—Native of moist situations on the mountains of Chili.—*Root* perennial. *Leaves* five-lobed, serrated, five-ribbed, papillary, downy, pulpy, permanent. *Footstalks* round, prickly, half a foot long. *Cluster* terminal. *Flowers* very numerous, on partial stalks. *Willd after Molina*.

Jussieu says, Gen. 452, that the *stem* is five feet high, with three or four *leaves* at the top.

2. *P. foveifolia*. Willd. n. 2. (*Llaupanke* amplissimo Sonchi folio; Feuill. Pernu. v. 2. 742. t. 31.)—*Leaves* lyrate, clasping the stem. — Found by Feuillée on the mountains of Chili. The *root* is said to be perennial, tapering. *Stem* herbaceous, three feet high, simple, round, leafy. *Leaves* a foot long, lyrate, obtuse, slightly wavy, and finely toothed or crenate; their lobes rounded, close, lying over

each other, finely downy, reticulated with veins; their base oblong, clasping the stem; midrib strong and convex; the under side palest. *Cluster* terminal, erect, bracteated, many-flowered. *Flowers* crimson, the lowermost a little remote, and of six petals or rather segments, the rest of but four; each segment is oval, about half an inch long, with a violet spot in the middle. *Stamens*, according to Feuillée, only equal in number to the petals, or rather segments of the flower. There is a disagreement between his account and the class, as well as character, indicated by Molina. This species is used in dyeing black. It also serves to stop the bleeding of the piles, when immoderate, as well as to relieve the pain of that complaint; the qualities of the herb being, as it seems, astringent.

For the *Panke* of Feuillée, a very different genus, see GUNNERA, sp. 2.

PANKINA, in *Geography*, a town of Russia, in the government of Kolivan; 68 miles N.W. of Biisk.

PANKIRA, a town of Hindoostan, in Baglana; 12 miles N. of Saler Moular.

PANKLIER, a town of Curdistan, in the government of Van, on the lake Van; 25 miles E. of Aklat.

PANKOVA, a town of Russia, in the government of Irkutsk, on the Ilim; 56 miles W. of Orlenga.

PANLANG, a town of the Birman empire, on the Rangoon branch of the Irrawaddy, from which the Rangoon is frequently called the Panlang-mioup. This was once a place of considerable magnitude, and is now of some importance; 16 miles N.W. of Rangoon.

PANNAGE, PANAGE, or *Pawnage*, are used in our law-books, &c. for the maff of woods; as of beech, acorns, &c.

As also for the running and feeding of swine, or other cattle, in forests.

And for the money taken by the agistors for the same.

PANNAGIUM LIBERUM, or *Free Pannage*, was a liberty of free running of swine in certain forests or woods, granted by privilege to certain private persons, and several religious houses.

Linwood defines pannagium, by "pastus pecorum in nemoribus, & in silvis, utpote de glandibus, & aliis fructibus arborum sylvestrium, quarum fructus aliter non solent colligi." It is also mentioned, 20 Car II. "Quisque villanus habens decem porcos dat unum porcum de pannagio;" by which it appears that one hog in ten was given for the pannage.

PANNAH, in *Geography*, a town of Hindoostan, in the country of Allahabad; 30 miles E.S.E. of Chatterpour. N. lat. 24° 48'. E. long. 80° 28'.

PANNEL, in *Law*. See PANEL.

PANNEL, in the *Scotch Law*, denotes the prisoner at the bar or person who takes his trial before the court of judiciary for some crime.

PANNEL, or *Panel*, in *Joinery*, &c. a tympan, or square piece of wainscot, sometimes carved, framed, or grooved in a large piece, between two mounters or upright pieces, and two traverses or cross pieces.

Hence also pannels or panes of glass, are compartments or pieces of glass of various forms; square, hexagonal, &c.

PANNEL, in *Masonry*, denotes one of the faces of a hewn stone.

PANNEL, in *Rural Economy*, a low stuffed saddle.

PANNELS of a *Saddle*, the two cushions or bolsters, filled with cow, deer, or horse hair, and placed under the saddle on each side, so as to touch the horse's body, and prevent the bows from galling or hurting the back.

PANNELA,

PANNELA, *Old*, in *Geography*, a town of Hindoostan, in Visiapour; 12 miles E. of Merritch.

PANNELA, *New*, a town of Hindoostan, in Visiapour; 22 miles W. of Merritch. N. lat. $7^{\circ} 3'$. E. long. $74^{\circ} 58'$.

PANNERBARY, a town of Bengal; 8 miles N.E. of Goragot.

PANNI, a town of Naples, in Capitanata; 9 miles S. of Troja.

PANNICULUS ADIPOSUS, in *Anatomy*, the stratum of fat placed under the skin. See *CELLULAR Substance*, and *MEMBRANE, Cellular*.

PANNICULUS Carnosus, in *Comparative Anatomy*, a thin subcutaneous stratum of muscular fibres in animals, to which there is no corresponding structure in the human subject. See *MAMMALIA*.

PANNIER, in *Architecture*. See *CORBEL*.

PANNIPUT, in *Geography*, a town of Hindoostan, in the country of Delhi; 50 miles N.W. of Delhi. N. lat. $29^{\circ} 25'$. E. long. $77^{\circ} 10'$.

PANNOA, in *Ancient Geography*, a town situated in the interior of the isle of Crete, between Gortyna and Gnoffus. Ptolemy.

PANNONIA, a large province of Europe, which was known to the Romans in the time of Augustus. It was bounded on the N. by the Danube, on the W. by Noricum, on the E. by the Danube as far as its junction with the Savus, near Mœsia, and on the S. it extended as far as Illyricum. The principal rivers of Pannonia were the Danube, the Dravus, and the Savus, which discharged themselves into the Danube, the Dravus E. of Murfa, and the Savus a little to the S. of Sirmium. It was during the war of Augustus with the Japydes and the Dalmatians that the Roman arms penetrated into the country of the Pannonians. But it became a Roman province under Tiberius. In the time of Antonine, Pannonia was divided into superior and inferior, the separation being made by the river Arrabo (Raab): one of these divisions was called Pannonia prima, and the other Pannonia secunda. The more ancient inhabitants of Pannonia were the Scordisci and Taurisci, who were in their origin Gauls. Ptolemy assigns to this country a great number of places; but none of them appear to be very considerable. This country was occupied by a semi-barbarous people, when Philip, king of Macedon, conquered it: but they soon afterwards revolted, and Alexander reconquered them. The Gauls, under the conduct of Brennus and Belgius, forcibly transferred it to Ptolemy, brother of the king of Macedon. Cæsar gained a settlement in part of it, and passed to it across the mountains, hence called "Alpes Juliæ." Tiberius, as we have said, added Pannonia to the Roman empire, and it continued tributary to the Romans till the fall of their empire. It afterwards became subject to the Goths, and then to the Huns, from whom Hungary is said to have derived its name.

PANNONICA BOLUS, in the *Materia Medica*, a name by which Kentman, and some others, have called the earth more usually known by the name of *bolus Toccaviensis*.

PANNONIUS, JANUS, in *Biography*, a modern Latin poet, born in 1434, was a native of Hungary. He travelled into Italy for instruction in polite literature, in which he excelled, and for the spread of which he felt so much ardour, that he used every effort to promote the study of it in his own country. He was raised to the see of Fünfkirchen, in Lower Hungary, where he died in 1472. He was distinguished for his proficiency in the Greek and Latin languages, in the latter of which he composed a variety of poems, which were printed separately, and also in the

"*Delicæ Poetarum Hungarorum*." An edition of them was published at Utrecht so lately as 1784, in two volumes 8vo.

PANNUNAH, in *Geography*, a town of Hindoostan, in the circar of Kariéh; 20 miles S.E. of Maltoy.

PANNUS, derived from *πᾶννός*, a web, a Latin word signifying cloth, web, &c.

PANNUS, in *Medicine*, a disease of the eye, popularly called the *web*.

The pannus is an excrescence arising on the adnata or conjunctiva, less hard and membranous than the unguis; and representing a web, or plexus of little veins swelled with blood.

Its cause is, an obstruction of the blood in the minute vessels of that tunic.

Its cure is much the same with that of the ophthalmia.

A chief difference is, that, in the unguis, the membranous excrescence only covers part of the eye, after the manner of a nail; whereas in the pannus it covers the whole.

PANNYA, in *Geography*, a town of Bengal; 45 miles W. of Nagore.

PANNYALLUM-CRUTCH, a town of Hindoostan, in Tinevelly; 15 miles S.E. of Coilpetta.

PANOCHIÆ, a name by which some chiralurgical authors call *buboes* in the groin.

PANOMI, in *Geography*, a town of European Turkey, in Macedonia; 16 miles S. of Saloniki.

PANOMPHÆUS, Παννομφαῖος, in *Mythology*, a designation given to Jupiter, because he was looked upon as the original author of all sorts of divination, having the books of fate, and out of them revealing either more or less, as he pleased, to inferior dæmons.

PANOPOLIS, in *Ancient Geography*, a town of Egypt, in the Thebaid, and the capital of the Panopolite nome.

PANOPSIA, Πανόψια, in *Antiquity*. See *PYANEPSIA*.

PANORAMA is a picture exhibiting a succession of objects, such as may be by the rays of light intercepted by the surface of a hollow sphere or cylinder, from all points of external objects to the eye in the centre of the sphere, or at a fixed point in the axis of the cylinder.

Panoramic Projection is the method of forming a panorama from the geometrical consideration of the properties of vision.

In the following principles of the panorama, the surface on which objects are supposed to be represented is that of a cylinder; though a sphere may be considered still more perfect, as its surface is every where equally distant from the eye, but a cylindric surface is more convenient for the purpose of delineation; and if the objects are not very distant from the intersection of a plane passing through the eye perpendicular to the axis, the distortion will not be perceptible. We premise the following definitions.

1. The cylindric surface on which objects are to be represented, is called also the panoramic surface; and the picture formed is called a panoramic view, or panoramic picture.

2. The point of sight is the place where the organ of vision is placed, in order to receive the impression of the images of the objects on the panoramic picture.

3. An original object is any object in nature, or an object which may be supposed to exist in a given position and distance, as a point, line, or solid.

4. An original plane is the plane on which original objects are supposed to be placed.

5. The point where an indefinite original line cuts the picture, is called the intersection of that original line.

6. The line on the picture where an original plane meets

PANORAMA.

or intersects it, is called the intersection of that original plane.

7. A line drawn through the point of sight parallel to an original line, is called the parallel of that original line.

8. A plane passing through the point of sight parallel to any original plane, is called the parallel of that original plane.

9. A surface of rays is that which proceeds from an original line, or from any line of the original object, by rays from all points of that line terminating in the eye. If the line in the original object be straight, the surface of rays is called a plane of rays, optic plane, or visual plane.

10. When the rays proceed from one or more surfaces of an original plane, the whole is called a pyramid of rays, or optic pyramid; and if the base is circular, it is called a cone of rays, visual cone, or optic cone.

In every kind of projection from a given point, the projection of a straight line upon any surface is the intersection of a plane of rays with the surface from all points of the straight line to the given point. Therefore the panoramic projection of a straight line is the intersection of the cylindrical surface and a plane. If a right cylinder is cut by a plane perpendicular to its axis, the section is a circle; if cut parallel to the axis, the section is a rectangle; and if cut obliquely to the axis, the section is an ellipsis. If the surface of the cylinder be extended upon a plane with the sections of the cylindrical surface and a plane cut in each of the positions here stated, the section made by the plane perpendicular to the axis will be a straight line; and the section made by cutting it parallel to the axis will also be a straight line; but the section made by cutting it obliquely will be a curve of similar properties as that known to mathematicians by the name of the sinical curve, or figure of the lines; therefore the projection of every straight line in a plane passing through the eye perpendicular to the axis of the cylinder, will also be a straight line on the extended surface; and every straight line in a plane passing through the axis will also be a straight line on the extended surface, perpendicular to that formed by the plane passing through the eye perpendicular to the axis.

The panoramic projection of any straight line not in a plane passing through the eye perpendicular to the axis, nor in a plane passing through the axis, is in the curve of an ellipsis; for in this case the optic rays which cut the cylinder will neither be in a plane parallel to the axis, nor in a plane perpendicular to it.

The panoramic representation of any straight line in a plane perpendicular to the axis, but not passing through the eye, is in the curve of an ellipsis, and the optic plane will be at right angles to another plane passing through the axis at right angles to the original line.

In the panoramic representation of any series of parallel lines, the optic planes have a common intersection in a straight line passing through the eye, and the common intersection will be parallel to each of the original straight lines; therefore the indefinite representations will pass through the extremities of the common intersection.

In the panoramic representation of any series of parallel lines in a plane perpendicular to the axis, but not passing through the eye, the common intersection of the optic planes is parallel to the plane on which the original lines are situated.

In the indefinite representations of any number of straight lines parallel to the axis, the visual planes will have a common intersection in the axis, and will divide the circumference of the cylinder into portions which have the same ratio to each other as the inclination of the visual planes.

If an original straight line parallel to the axis be divided into portions, the representations of the portions will have the same ratio to each other as the originals.

If in any original plane there be a series of straight lines parallel to each other, and also another series of straight lines parallel to each other, and at any given angle with the former series, the common intersections of the visual planes will make the same angle with each other, which any line of the one series makes with any one of the other series, and the common intersections will be in a plane parallel to the original plane; and, therefore, if the original plane be perpendicular to the axis, the common intersections of the visual planes will also be in a plane perpendicular to the axis. Hence the common intersections of visual planes from any two systems of straight lines, parallel to any two straight lines at a given angle with each other in a plane perpendicular to the axis, are also in a plane perpendicular to the axis, and make the same angle with each other which the two lines in the original plane make with each other.

11. The two points where the parallel of an original line inclined to the axis of the cylinder meet the panoramic surface, are called the vanishing points of that original line.

12. The intersection of the parallel of an original plane is called the vanishing line of that plane.

13. A straight line drawn from any point in the axis of the cylinder at right angles to the same to meet the panoramic surface, is called the distance of the picture.

14. The centre of a plane parallel to the axis, is the point where a straight line from the eye perpendicular to the plane meets it.

15. The panoramic centre of a plane parallel to the axis, is the point where a straight line drawn from the eye perpendicular to the plane cuts the picture.

16. The station point, is the point where the axis intersects the original plane.

17. The centre of an original line, is the point where a straight line, drawn from the station point perpendicular to the original line, cuts the original line.

18. The panoramic centre of an original line, is the point where a straight line, drawn from the station point perpendicular to the original line, cuts the picture.

19. The distance of an original plane parallel to the axis from the picture, is the straight line drawn from the panoramic centre to the centre of the original plane.

20. The distance of an original line from the picture, is the straight line drawn from the panoramic centre to the centre of the original line.

21. The distance of an original plane, is the straight line drawn from the eye to the centre of the original plane.

22. The distance of an original line, is the straight line drawn from the station point to the centre of the line.

An original line parallel to the axis of the panorama has no vanishing points.

An original plane parallel to the axis of the panorama has two vanishing lines.

The vanishing line of a plane perpendicular to the axis of the panorama, is a circle on the panoramic picture; but if the panoramic surface be extended upon a plane, it becomes a straight line.

The vanishing lines of all planes inclined to the axis are ellipses, and when extended upon a plane become sinical curves, which are also termed panoramic curves, as being the only curve which the cylindrical picture produces when developed.

PROBLEM I.

To describe the panoramic curve to given dimensions. Let
A B

PANORAMA.

AB (*Plate 1. fig. 1.*) be the length of the curve; bisect AB in C, draw CD perpendicular to AB; make CD equal to the deflection of the arc from the chord AB; from the point C, with the distance CD, describe the quadrant DE; divide the arc DE into any number of equal parts (say four,) also divide either half, CB, into the same number (four) of equal parts; let *l, i, g,* be the points of division in the quadrantal arc; draw *lk, ib, gf,* perpendicular to AB, cutting it at *k, b, f;* and let *K, H, F,* be the points of division in CB; draw *KL, HI, FG,* perpendicular to AB; make *KL, HI, FG,* respectively equal to *kl, bi, fg;* construct perpendiculars upon CA in the same manner; through all the points *G, I, L, D,* describe a curve, which will be that of the panorama.

The curve ADB is that which would be found by cutting a semi-cylinder, whose circumference is AB, at an altitude CD distant from the surface from a plane perpendicular to the axis, at a quadrant's distance from the point A or B in the extremity of the diameter of the plane, perpendicular to the axis. Therefore the whole panoramic curve will be double the length of AB; the other part being a similar and equal curve above the line AB produced, and consequently a curve of contrary flexure.

The panoramic curve takes place when the cylinder is cut by a plane at oblique angles to the axis.

PROB. II.

To find the indefinite representation of lines parallel to the original plane, in a plane parallel to the axis of the picture; given the height of the eye, the intersection of the original plane, and the distance of the original plane from the picture.

Let *P,* *fig. 2. N° 1,* be the station point; *GKH I* the intersection of the picture; and *AB* a line in the original plane on which the plane parallel to the axis stands.

In *fig. 2, N° 5,* draw *PK,* which make equal to *PK, N° 1.* In *N° 5,* draw *PO* and *Kw* perpendicular to *PK;* make *PO* equal to the height of the eye; draw *ow* parallel to *PK;* produce *PK* to *r;* in *N° 1,* draw *Pr* perpendicular to *AB,* cutting *AB* at *r,* and the intersection of the original plane with the panoramic surface at *K;* make *Pr, N° 5,* equal to *Pr, N° 1;* draw *rs* perpendicular to *PK;* in *N° 5,* make *ri, tu, uv,* equal to the height of the several lines, whose indefinite representations are required above the original plane; produce *ow,* meeting *rs* at *s;* produce *Kz* to meet *Os* at *w;* draw *Or, Ot, Ou,* and *Ov,* cutting *Kw* respectively at *v, x, y,* and *z.* In *N° 2,* make *GH* equal to the semi-circumference *GKH, N° 1;* bisect *GH* at *w;* draw *wv* perpendicular to *GH;* make *wv, wx, wy,* and *wz,* respectively equal to *wv, wx, wy,* and *wz, N° 5;* then with the common length *GH,* and the deflections *wv, wx, wy,* and *wz,* describe the curves *GvH, GxH, GyH, GzH,* which will be the envelope of the representation of the lines required, and *G* and *H* will be their vanishing points. For *OPrs, N° 5,* may be considered as a plane passing along the axis of the cylinder; *OP* the axis, *O* the eye, *P* the station point, *Kw* a section of the cylindrical surface, and *Or, Ot, Ou,* and *Ov,* visual rays; and, consequently, the points *v, x, y, z,* will be the representations of *r, t, u, v;* and since *r, t, u, v,* may be considered as the centres of the original lines, whose representations are required, and since the optic planes of these lines cut the cylinder obliquely, the sections will be elliptical, and, consequently, their envelope will be the figure of the lines as here described.

PROB. III.

To describe the representation of a line in a plane perpendicular to the axis of the cylinder, giving the seat of the line on the original plane.

In *N° 2,* draw *Gd* perpendicular to *GH;* make *Gd* equal to the descent or deflection of the curve, and describe the quadrantal sinical curve *d w,* and *d w* will be the representation of a line perpendicular to the plane, in which the originals of *G v H, G x H, G y H,* and *G z H,* are situated.

PROB. IV.

Given the indefinite representation *GzH, N° 2,* of a straight line, to determine the finite portion, whose seat is *AB, N° 1.*

Draw *PA* and *PB, N° 1,* cutting the intersection at *a* and *b;* make *wa, N° 2,* equal to the extension of *Ka, N° 1;* and *wb, N° 2,* equal to the extension of *Kb, N° 1;* draw *aa' and bb', N° 2,* perpendicular to *GH,* cutting the curve *GzH* at *a' and b',* and *a'z b'* will be the finite portion required; *a''y b'', a'''x b''',* and *a''''v b'''',* will be the same portions of the indefinite representations *GyH, GxH,* and *GvH.*

The following examples shew the application of the principles in the representation of solid objects.

Example 1.—Let *CDEF, fig. 2, N° 1,* be the plan of a house, in contact with the picture at *C.* Through the station point *P* draw *GH* parallel to *DC,* cutting the intersection of the panoramic picture in the points *G* and *H;* also through *P* draw *KI* parallel to *ED,* or *FC.* cutting the picture in *I* and *K;* then *G* and *H* are the vanishing points of all lines parallel to *EF* or *DC,* and *I* and *K* the vanishing points of all lines parallel to *CF* or *DE;* draw *FP* and *DP* cutting the picture at *f* and *d.* Let *WV* be the ridge of the building, bisecting *ED* at *W,* and *EC* at *V;* produce *WV* to *Y,* cutting *IK* at *U;* make *UY* equal to the height of the house, *N° 3* and *4;* and make the angle *UYZ* equal to half the vertical angle of the roof, and let *YZ* cut *IK* at *Z;* draw *XQ* parallel to *YZ,* cutting *KI* or *KI* produced at *Q;* draw *Zx* parallel to *VW;* produce *ED* to *x,* and *FC* to meet *xZ* at *T;* join *Qx* and *QT,* which are the intersections of the optic planes, formed by the inclined side of the roof, and the vertical planes standing upon *DE* and *CF;* draw *IN* parallel to *PO* and *ON* parallel to *IP.* To find the inclination of the optic planes; draw *PM* perpendicular to *xQ,* cutting *xQ* at *u,* and the panoramic intersection at *M;* from *P,* with the distance *Pu,* describe the arc *uJ,* cutting *PI* at *J;* join *OJ;* produce *NI* and *OJ* to meet each other in *S.* In like manner, draw *Pt* perpendicular to *TQ,* cutting *TQ* at *v,* and the panoramic intersection at *t;* from *P* as a centre, with the radius *Pv,* describe the arc *vw,* cutting *IP* at *w;* join *ow;* produce *NI* and *ow* to meet each other in *R;* then *NOS* is the inclination of the optic plane whose intersection is *Qx,* and *NOR* is the inclination of the optic plane whose intersection is *QT.*

Upon any convenient line *IH, fig. 2, N° 6,* extend the panoramic intersection; according to the corresponding places of *N° 1,* are shewn by similar letters; that is, *I t, t G, G d', d C', C' f', f' K,* and *K H, N° 6,* would cover *I t, t G, G d', d C', C' f', f' K,* and *K H, N° 1.* In *N° 6,* draw *t R, G o, d' d, C' c, f f', K k* perpendicular to *I H.*

In *N° 5,* produce *K P* to *a;* make *Pa* equal to the radius of the cylinder; through *a* draw *io* parallel to *OP;* on *Pa* make *Pj* equal to *Pj, N° 1,* and *Pq, N° 5,* equal to *Pq, N° 1;* draw *jq* and *qb, N° 5,* perpendicular to *Pa;*

PANORAMA.

make $q b$ and $j g$ each equal to the height of the walls, $N^{\circ} 3$ and 4 ; join $O g$ and $O h$; produce $O g$ to l , and $O h$ to i , meeting $o i$; produce $O j$ and $O q$ to meet $G o$ at o and k .

In $N^{\circ} 6$, make $t R$ equal to $N R$, $N^{\circ} 1$; $G o$ equal to $G o$, $N^{\circ} 5$; $G l$ equal to $G l$; $K k$ equal to $G k$; $K i$ equal to $G i$; describe the panoramical curves $I l K$, $I o K$; $G k H$, $G i H$; then the curves $I o K$ and $G k H$ will cut each other at c , and the curves $I l K$, $G i H$, will cut each other at C , so that the points C , C , c , will be in the same perpendicular; $C c$ will thus represent the angular line of the building; let the perpendicular $d' d$ cut the curve $G i H$ at D , and the curve $G k H$ at d ; and the intercepted portion $D d$ is the angular line at one end; in like manner, let the perpendicular $f f$ cut the curve $I l k$ at F , and the curve $I o K$ at f ; and the intercepted portion $F f$ of the perpendicular $f f$, is the representation of the angular line at the other end; therefore $c C D d$ represents the front, and $c C F f$ the end, exclusive of the triangular part adjoining the roof, which will be formed in the following manner; make $t x$ and $x u$ equal to $G K$ each; describe the same panoramical curve $R C x$; and if the other semi-panoramical curve $x v w$ is described, and if $k K$ be produced to v , v will be the vanishing point for the gable top; and if $K n$ be made equal to $K v$, n will be the vanishing point of the other inclined plane of the roof; and thus the representation of lines and planes will have vanishing points and vanishing lines, as in the methods of describing the perspective representation of objects upon a plane surface; and if the points d , D , c , C , f , F , are found, and the lines $c d$, $C D$, and $c f$, $C F$, are made straight instead of being curved and produced, they will find their own vanishing points in the line $I H$; but more remote from each other than the points G and K . What is here observed, is exemplified in $N^{\circ} 7$, as will appear sufficiently clear by a little reflection.

The example here shewn is very distorted, on account of the smallness of the panoramical cylinder, and the size of the object, which was obliged to be very large, in order to give a clear elucidation of the principles.

Example 2. *fig. 3*, shews the panoramical representation of a row of houses, upon the surface of a cylinder of greater radius than that of *fig. 2*. $N^{\circ} 1$, where the pictorial objects appear much more agreeable to the eye than that of *fig. 2*; the lines which form the roofs are in this example represented straight, though in reality they are curves, as a great deal of trouble is saved, and as the error occasioned by their introduction is so trifling as not worth regarding.

It now remains to shew the truth of the operations used in the construction of *fig. 2*; let it now be proved, that $x Q$ and $T Q$ are the intersections of the optic planes, formed by the inclined lines of the gables. From the definition given, an optic plane is that passing along an original line, and through the eye; therefore, if a straight line be drawn through the eye parallel to the original line, the line thus passing through the eye, and the original line, will be in the same plane, that is, both in the optic plane; and if two planes be drawn along two parallel lines, their intersections with a third plane will be parallel; now the parallels $F T$ and $K I$ are the intersections of two parallel planes; $F T$ that of the vertical plane in which the inclined original line is situated, and $K I$ that in which the eye is situated, or in which the line parallel to the inclined line is situated; the point T is the intersection of the inclined line of the roof, and the point Q the intersection of the line drawn through the eye parallel to the inclined line of the roof; therefore the optic plane will pass through the points T and Q , and consequently $T Q$ is the intersection of the optic plane, and

the original plane. In the same manner it may be shewn that $x Q$ is the intersection of the optic plane, formed by the other inclined line of the farther gable in the same plane with the former line.

Next let it be shewn that the angles $N O S$ and $N O R$, $N^{\circ} 1$, are the inclinations of the optic planes, whose intersections are $x Q$ and $T Q$. The inclination of any two planes is measured by a third plane, perpendicular to their common intersection; now $T Q$ is the intersection of the optic plane, and $P v$ is perpendicular to $T Q$; and because $P w$ is equal to $P v$, and $P o$ perpendicular to $P w$, and equal to the height of the eye; conceive the plane of the triangle $w P O$ to be raised perpendicular to the original plane, so that the base $P w$ may coincide with $P v$; then O will represent the eye in its true place, and the point w will be upon v ; and since the intersection $T Q$ would be perpendicular to the plane of the triangle, every line drawn in the plane of the triangle from v , would be perpendicular to the intersection $T Q$, and consequently, the line drawn in this plane from v to O , would also be perpendicular to the intersection; therefore the angle $P w O$ is the inclination of the plane, and, consequently, the alternate angle $N O R$. In the same manner it may be shewn, that $N O S$ is the inclination of the plane whose intersection is $x Q$.

Now to shew that $N R$ is the deflexion of the curve made by the optic plane, it only requires to be considered that the transverse axis of the ellipsis made by the optic plane, is in the plane which measures the inclination of the optic plane to the original plane: for this purpose, $P O N R$ may be considered as a semi-section of the cylinder along the axis, and $N R$ a section upon the surface; therefore $O R$ will represent half the greater axis, and $N R$ the deflexion of the curve, or its descent below the vanishing line of the horizon. *Fig. 2*. $N^{\circ} 5$, is also to be considered as a section of the cylinder, of which $O P$ represents the axis, $G o$ and $w K$ the sides; and because the appearance of all points in the same plane perpendicular to the axis, at equal distances from the station point, will be at the same height on the surface from the original plane, or from the plane passing through the eye parallel to the original plane, their heights will be found by setting their distances upon $P a$, then erecting lines perpendicular to $P a$, from each point of the section; then setting the heights of the points upon these lines, and drawing lines from O through the top of each perpendicular till they cut $G o$; then the distance from G to each point of section, gives the distance of each point from the plane passing through the eye upon the panoramical surface.

Now let the cylinder be conceived to be enveloped by $N^{\circ} 6$, so that $I H$ may fall upon the circumference of a circle in a plane perpendicular to the axis, then every line will fall in its true position, and the representative object will produce the same pyramid of rays as the original object, the eye being supposed to be fixed at its true distance above the line $I H$; and, consequently, nothing more will be required to excite the existence of the object, than to give the representative surfaces their proper colours, light, and shade, according to the distance of the original.

Hitherto straight lines have been represented by portions of the sinical curve when extended, or by portions of an ellipsis, when the sheet on which the objects are represented is brought in contact with the surface of the cylinder, as they ought properly to be; but if the radius of the cylinder is of sufficient extension, and the objects to be represented of proper magnitude, any attempt to represent straight lines by curves from the hands of an artist would be absurd, except when the object to be represented is very near to the pano-

PANORAMA.

ramic surface, in which case a curvature in the line may be sensible, also at a moderate distance: the curve can only be observed in a series of objects in a straight line; it will therefore be sufficient to represent the straight lines of each individual object by straight lines also, but to preserve the curve, or rather the polygonal figure inscribed in the finical curve in the series, as the inflexions or angles will hardly be visible.

A straight line will therefore be represented by finding the representation of its extremities, and joining the representative points; but if it is of great extent, it may be found by finding a number of points, and joining every two adjoining points in succession by a straight line, and the whole will assume the form of a curve, which will be the representative of the straight line.

Plate II. shews a series of figures, such as may be supposed to constitute the whole of the practice of representing panoramic objects. S is the station point; the objects are referred to in alphabetical order from A, B, C, &c. to H; each extreme point of the lineal parts of the same object has the same letter affixed, with a numerical index, which increases, by unity, in tracing round the circumference in progressive order. The points where the optic lines cut the panoramic surface are numbered with the same figure from the same object, each number having an index corresponding to that of the point of the object to be represented. The numbers are placed in successive order, agreeing with the order of the alphabet.

N^o 1. The intersection of the panorama and the original plane, with the figures of the objects to be represented.

N^{os} 2, 3, 4, Vertical sections of the panorama passing along its axis, in order to ascertain the heights of the several places of each object; E the point of sight or place of the eye, S the station point, P Q a section of the cylinder, shewing the heights of the objects.

The objects to be represented are, A, a point, the optic ray from which cutting the intersection at 1; B a straight line, the optic rays from which cutting the intersection at 2¹, 2²; C a line standing upon C, the optic ray from which cutting the intersection at 3; D an inclined line, whose feet is represented by D¹, D², the optic rays from which cutting the intersection at 4¹, 4²; E an angle, the optic rays from which cutting the intersection at 5¹, 5², 5³; F a triangle, the optic rays from which cutting the intersection at 6¹, 6², 6³; H a rectangle, the optic rays from which cutting the intersection at 7¹, 7², 7³, 7⁴; and, lastly, G a circle, the optic rays from which cutting the intersection at 8¹, 8², 8³.

The distances of the objects are placed upon the panoramic sections N^{os} 2, 3, 4, from S, upon the lines S, P, or upon S P produced; then drawing lines from the points to E, give the heights upon P Q.

The perpendicular standing upon C, N^o 1, is thus found: In N^o 3, draw C C from C, perpendicular to S P, equal to the height of the perpendicular upon C, N^o 1, and draw the straight lines C E, C E, N^o 3, cutting P Q at 3 3, then 3 3 is the panoramic length of C C. The upper extremity of the inclined line D will be found by ascertaining the panoramic height of the perpendicular, from the elevated end to the original plane.

N^o 5 shews the panoramic representation of the several objects; V L the vanishing line of the horizon; the intersections of the optic rays are extended upon V L from N^o 1, the references upon the intersection N^o 1, and upon V L N^o 5, being the same. The heights of the several points are taken from the sections N^{os} 2, 3, and 4, from Q downwards towards P, and placed from the corresponding points in V L, N^o 5; also downwards upon the perpendiculars, gives

the several points of the objects; thus *a* is the representation of the point A, N^o 1; *b*, *b*, of B¹, B², &c. In the circle, the points for half the curve are found, the other half being repeated in the same order from the middle line, each line serving for two points, so that the three lines give eight points; the extreme lines are tangents which are equivalent to two points.

The points around the circumference of the intersection N^o 1, are extended upon V W and X Y, according to the principle of Renaldinus, by setting three-fourths of the radius, without the circle, upon the opposite side of the tangents V W and X Y; and transferring the divisions of V W and X Y upon V L, N^o 5, gives the points corresponding to the intersection.

The panoramic surface being enveloped by N^o 5, the representations of the objects will be placed in their true position, and will form the same picture at the point of sight, if correctly, painted as the objects themselves.

A practical method of forming all straight lines on the panoramic surface in its place, without development, is to ascertain the position of the objects, also the heights of the centres of the line to be represented; then fixing the eye in its position, and holding a straight edge parallel to the line to be drawn in a plane with the point of sight and the point representing the centre of the line, mark several points in the same plane, on the panoramic surface; these points being joined, will give the representation of the line required.

In preparing for panoramic projections, whatever objects are intended to be represented, a proper point of view should be chosen from this situation; a sketch of all the surrounding objects should be made according to the development of the panorama; for though the painting itself may be performed upon the cylindric surface, it is more eligible to sketch upon a plane. The next thing to be done is to take a survey of the objects, observing their positions to each other; then with a plane table fixed on the point of view quite level, take the successive angles of the surrounding objects by means of a moveable limb which may carry two pieces, one at each extremity, perpendicular to the surface of the plane table; one piece being fixed in the supposed axis of the panorama, containing a sight hole for the point of view, so that the moveable part will consist of three bars, the bottom one serving as a straight edge for drawing the angles of position: the heights of the objects may be marked upon the other limb parallel to that fixed in the axis; and let it be observed, that the point of view in the axis, the edge of the limb which gives the heights of the objects, and the edge of the bottom bar by which the angles are drawn, must be in a plane passing along the axis: mark the vertical lines on the sketch, and the lines on the plane table, which shew their position, with corresponding characters, otherwise it would be difficult to distinguish what the numerous lines apply to. The moveable edge of the index, which describes the circumference of the cylinder, should be of ivory, as the various heights may be marked with pencil, and rubbed out at pleasure, as these heights may be transferred to a piece of paper marking them with the same character as that of the sketch, and with the addition of top of chimney, shaft, ridge of roof, top of wall, as the heights may be the terminations of such parts of the said objects, or instead of writing any mark, in drawing by representing a slight form of the parts of the object.

Instead of the ivory edge of the bar, which describes the panoramic surface, a slit, or very narrow aperture, formed by a double bar, may be used.

The tendency of every line, horizontal or inclined, may be found by a fifth bar, moveable round a centre, which centre must be also moveable upon the edge of the limb which gives

gives the panoramic heights of the objects; the plane in which this fourth bar moves must be a tangent to the panoramic surface, at the line which is intersected by the plane passing along the axis, along the straight edge of the bottom bar, and along the edge where the heights of the objects are marked; then if the edge of this fourth moveable bar be brought in a plane with the eye and the original line, the angle which it forms with the edge of the vertical limb is the inclination of the line on the picture.

PANORMA, or **PANORAMA**, in *Geography*, a harbour on the N. coast of the island of Myconi. N. lat. $37^{\circ} 29'$. E. long. $25^{\circ} 23'$.

PANORMO, a town of Asiatic Turkey, in Natolia, on the S. coast of the sea of Marmora; 16 miles S.E. of Artaki.—Also, a town of European Turkey, in Albania, situated on a gulf of the Adriatic, opposite the island of Corfu; 45 miles S.S.E. of Valona. N. lat. 40° . E. long. $20^{\circ} 1'$.

PANORMUS, in *Ancient Geography*, (*Palermo*), a town of Sicily, situated towards the N.W., founded, as it has been said, by the Phœnicians. It held a distinguished rank among the towns of Sicily. In the year of Rome 499 it was taken by the Romans, and in 503 they gained a battle there under the orders of the proconsul Metellus. It afterwards became a Roman colony.—Also, a small gulf of Achaia, towards the N.W., into which the three rivers Charadus, Lelemus, and Bolineus discharged themselves.—Also, a port of Greece, and the first on the E. coast of Attica, near the promontory of Sanium. Ptolemy.—Also, a town on the N. coast of the isle of Crete, between Citzæum and Heraclæum. Ptol.—Also, a port of the isle of Cephalonia.—Also, a port of Epirus, near that of Onchestus. Ptol.—Also, a town of the Thracian Chersonesus, between Elœa and Cardia. Pliny.—Also, a town of Macedonia, in Chalcidia. Ptol.—Also, a port of Africa, in Marmorica, upon the coast of the nome of Lybia. Ptol.—Also, a port of the town of Oricum, on the Ionian sea. Strabo.—Also, a small port of Asia Minor, in Ionia, N.E. of the promontory of Posidium, S.E. of the promontory of Trogilium, and S. of Miletus. South of this port was the famous temple of Apollo Branchidæ, and to this place strangers repaired to consult the oracle. The ancients pretended that the stream which discharged itself into the sea at this port, sprang from mount Mycale, and passed under the sea till it re-appeared in the vicinity of this temple.

PANORPA, in *Entomology*, a genus of insects of the order Neuroptera: the generic character is, mouth lengthened into a cylindrical horny proboscis; feelers four, nearly equal; stemmata three; antennæ filiform, longer than the thorax; tail of the male armed with a chelate appendage; but in the female it is unarmed. There are nine

Species.

* **COMMUNIS**. This, as its name imports, is the most familiar of all the species. It is frequently seen in our meadows during the early part of the summer. It is a longish-bodied fly of a moderate size, with four transparent wings, elegantly variegated with deep brown spots; the tail of the male insect, which is generally carried in an upright position, is furnished with a forceps, somewhat in the shape of a lobster's claw.

GERMANICA. Wings equal, hyaline, tipped with brown. It inhabits Germany, and resembles the communis.

SCORPIO. Wings equal, black spotted with white; body dusky. It is found in different parts of North America.

FASCIATA. The wings of this likewise are equal, yel-

lowish with black dots and bands. It is found in North America.

HYEMALIS. Wings subulate, slightly incurved, ciliate: the female is apterous. It is a small insect, and is found in Saxony.

TIPULARIA. Wings immaculate; abdomen falcate; the legs are very long. It inhabits Italy; the body is yellow, the wings equal.

CAPENSIS. The wings are equal and immaculate; body ferruginous. It inhabits the Cape.

JAPONICA. Wings equal, hyaline, with two black wings. It is found in Japan.

COS. Wings erect, lower ones nearly linear and very long. This is a native of Greece and the islands of the Archipelago, and is an insect of a very peculiar appearance. It is distinguished by having the lower wings so extremely narrow or slender as to resemble a pair of linear processes with an oval dilatation at the tip, while the upper wings are very large, oval, transparent, and beautifully variegated with yellowish-brown bars and spots.

PANORPA. See *CICADA Tibicen*.

PANOV, in *Geography*, a river of Russia, which runs into the Niznei Tungusku, N. lat. $64^{\circ} 40'$. E. long. $102^{\circ} 54'$.

PANREEDY, a town of Bengal; 30 miles S.S.E. of Currackdeagh.

PANSACCHI, DON, in *Biography*, an Italian serious opera singer with a tenor voice, who having resided nine years in Spain, was allowed to qualify himself with the title of Don. He was in the service of the elector of Bavaria in 1772, when we often heard him. His voice was not bright, or very mellifluous; but his knowledge of music, intelligence in the drama, taste, and expression, were of a superior kind. He had acquired, by his long residence in Spain, the true national style of singing *seguillos, tonadillas*, and other music of that country.

PANSAGUTCHY, in *Geography*, a town of Bengal; 8 miles N. of Rajemal.

PANSANG, or **PULO-PANSANG**, a small island in the gulf of Siam. N. lat. $9^{\circ} 15'$. E. long. $103^{\circ} 30'$.

PANSAR, a town of Hindoostan, in Guzerat; 16 miles N. of Amedabad.

PANSHAH, a town of Meckley; 55 miles S.S.E. of Munnypour.

PANSHALA, a town of Guriel; 30 miles E. of Pati.

PAN-SIEN-ING, a town on the W. coast of the island of Formosa. N. lat. $23^{\circ} 56'$. E. long. $119^{\circ} 52'$.

PANSRUCKY, a town of Hindoostan, in Bahar; 27 miles S. of Bahar. N. lat. $24^{\circ} 46'$. E. long. $85^{\circ} 44'$.

PANTÆNUS, in *Biography*, a learned Christian philosopher of the Stoic sect in the second century, flourished, according to Cave, about the year 182. His descent, his country, and the time of his birth, are all uncertain. He is thought to have been one of the masters of Clement of Alexandria; and is mentioned with high respect by Alexander, bishop of Jerusalem, in a fragment of a letter to Origen, preserved by Eusebius, in which he expressly says that Pantænus was the person who introduced him to the acquaintance of that father. He was held in very high estimation, and is referred to by Origen with great respect, and Photius speaks of him as a hearer of some of those who had seen the apostles, and even of the apostles themselves. He presided over the catechetical school at Alexandria with great reputation and success. He was extremely zealous in the cause of Christianity, and undertook a mission into Ethiopia, to instruct the inhabitants in the principles of that

that religion. After his return to Alexandria Pantæus resumed the presidency of the catechetical school, in which he continued to explain the scriptures publicly under the reigns of the emperors Severus and Caracalla. According to Jerome, there were, in his time, extant "Commentaries" of Pantæus upon the Scriptures, but there is nothing now remaining of his writings, excepting a short passage in the "Eclogæ," ascribed to Clement of Alexandria, containing the following rule respecting the language used in the prophecies of the Old Testament; "that the prophets often express themselves in indefinite terms, and that the present tense is frequently used by them both for the preterite and future." Pantæus is supposed to have died about the year 213. Dupin. Lardner.

PANTAIA, in *Geography*. See PANDAIA.

PANTALARIA, a small island in the Mediterranean, between the island of Sicily and Cape Bon, on the coast of Tunis; about 25 miles in circumference, and containing about 4000 inhabitants. Its chief productions are olives, figs, raisins, capers, and cotton; the cattle are numerous; but bread corn is imported from Sicily. The language is a mixture of Italian and African. N. lat. $36^{\circ} 55'$. E. long. $12^{\circ} 15'$.

PANTALEO, ST., a town of the island of Sardinia, the site of which was anciently that of the episcopal city of Dolio; 16 miles N. of Cagliari.

PANTALEONE, a small island in the Mediterranean, near the W. coast of Sicily, formerly united to the continent by a neck of land, which was destroyed by the inhabitants in order to secure themselves against the enemy. The ancient Motya stood in this island. N. lat. $37^{\circ} 56'$. E. long. $12^{\circ} 28'$.

PANTALEONE, in *Music*, a stringed instrument in Germany at the latter end of the seventeenth century. The inventor's name was Hebenstrich; but from the success of his instrument, he assumed that of *Pantaleone*. It was more than nine feet long, and had, when in order, 186 strings. The tone was produced by two *bagettes*, or sticks, like the dulcimer; it must have been extremely difficult to the performer, but seems to have been capable of great effects. Mr. Binder, organist of the Duom Kirk, at Dresden, was the last person who played upon it. It was this instrument, and the performance upon it at Paris in 1705, which gave birth to a very ingenious little work, under the title of "Dialogue sur la Musique des Anciens," by the abbé Chateaufeu. When we saw the ruins of this instrument at Dresden, soon after the seven years' war, the strings were almost all broken, and the court was so impoverished as not to like to be at the charge of new mounting it. It used to be one of the musical curiosities of that city, during the time that the elector of Saxony was king of Poland.

PANTALOON, or PANTALON, the name of an ancient garment frequent among our forefathers, consisting of breeches and stockings all of a piece. A dress somewhat similar has been lately revived and much used.

The denomination comes from the Venetians, who first introduced this habit, and who are called *Pantalonis*, from St. Pantalon, who was formerly their patron.

PANTALON, on the *Theatre*, is a buffoon or masked person who performs high and grotesque dances, and shews violent and extravagant postures and airs.

The word is also used for the habit and dress these buffoons usually wear; which is made precisely to the form of their body, and all of a piece from head to foot.

And hence those who wear a habit of this kind, for convenience under their other clothes, are called pantaloons of Venice.

PANTANO, in *Geography*, a town of Sicily, in the valley of Noto; 10 miles S. of Modica.—Also, a town of Italy, in the department of the Panaro; 15 miles S.W. of Modena.—Also, a town of Naples, in Calabria Ultra; 9 miles E. of Bova.—Also, a river of Naples, which runs into the sea; 10 miles E. of Bova.

PANTAR, an island in the East Indian sea, of a square form, about 48 miles in circumference, separated from the E. coast of the island of Lomablen by the strait of Alvo; and from the W. coast of Ombay by a narrow channel, called the "Strait of Pantar." S. lat. $8^{\circ} 10'$. E. long. $124^{\circ} 30'$.

PANTARBE, in *Natural History*, a name given by authors to an imaginary stone, the virtues of which were similar to those of the magnet; but exerted upon gold as those of the load-stone upon iron. The ancients, as well as later writers, seem to have all had an opinion, that there was such a stone as this, and the amphitane of Pliny is described as possessing this remarkable quality; but neither they nor we ever found reason from any experiment to believe that there was any such stone.

PANTHEA, Πανθεα, among the *Ancients*, were single statues, composed of the figures, or symbols, of several different divinities combined.

Father Joubert, who calls them Panthea, and who has observed them on several medals, says their heads are most commonly adorned with the symbols or attributes belonging to several gods.

An instance of this kind we have in a medal of Antoninus Pius; which at the same time represents Serapis, by the bushel it bears; the Sun, by the crown of rays; Jupiter Ammon, by the ram's horns; Pluto by the large beard; and Æsculapius, by the serpent twisted in his hand.

M. Baudelot, in a dissertation on the Lares, will have the Panthea to have had their rise from the superstition of those, who, taking several gods for the protectors of their houses, united them all in the same statue, by adorning it with the several symbols proper to each of these deities.

PANTHEISTS, is a denomination by which the followers of Spinoza are distinguished, and derived from the nature of their doctrine, which confounds God with the universe; representing them as one and the same being, and admitting only one substance whence all things proceed, and into which they all return. See SPINOZISM.

PANTHEON, Πανθεον, thus named from παν, *all*, and θεος, *God*, in *Architecture*, a temple, or church, of a circular form; dedicated to all the gods, or to all the saints.

The Pantheon of ancient Rome is of all these edifices the most celebrated, and that from which all the rest take their names. It was built by Agrippa, son-in-law of Augustus, in his third consulate, twenty-five years before Christ: though several antiquarians and artists have supposed that the Pantheon existed as long ago as the commonwealth, and that Agrippa only embellished it and added the portico. To this purpose they allege the authority of Dion Cassius, who speaking of Agrippa, says, he also finished or perfected the Pantheon.

It was dedicated by him to Jupiter Ultor, Jupiter the Revenger, according to Pliny's account; according to Dion Cassius, to Mars, Venus, and Julius Cæsar; but according to the most probable opinion, to all the gods; and had the name Pantheon, on account of the great number of statues of the gods ranged in seven niches all round it; and because it was built of a circular form, to represent heaven, the residence of the gods; or because it was dedicated to all the gods, (quali παντων θεων.) It has but one door.

PANTHEON.

It was one hundred and forty-four, or, as Fabricius says, one hundred and forty feet diameter within, and just as much in height, and of the Corinthian order. The roof was curiously vaulted, void spaces being left here and there for greater strength. The rafters, forty feet long, were plated with brass. There were no windows in the whole edifice; but sufficient light was let in through a round hole in the top of the roof. Before each niche were two columns of antique yellow marble fluted, and of one entire block. The whole wall of the temple, as high as the grand cornice inclusive, was cased with divers sorts of precious marble in compartments: and the frieze was entirely of porphyry. The outside of the front was anciently covered with plates of brass gilt, and the top with plates of silver, in lieu of which lead was afterwards substituted. The gates were of brass, and of extraordinary size and workmanship.

The eruption of Vesuvius, in the reign of Tiberius, and a great fire in the reign of Titus, damaged the Pantheon very considerably: but it was successively repaired by Domitian, Adrian, and Septimius Severus: and it subsisted in all its grandeur till the incursion of Alaric, in the time of Honorius: on this occasion it was stripped of several of its statues and ornaments of gold and silver. About thirty-nine years after this, Genseric, king of the Vandals, took away part of its marbles and statues: at length pope Boniface IV. obtaining this Pantheon of the emperor Phocas, converted it into a church, without any alteration in the building; and dedicated it to the Virgin, and all the martyrs. And it still subsists at Rome under the title of Notre Dame de la Rotonda. However, in 655, Constantius II. stripped it of its inside and outside brazen coverings, which he transported to Syracuse.

There was also at Rome another Pantheon, dedicated to Minerva, as the goddess of medicine. It was in the form of a decagon, and the distance from one angle to another measured $22\frac{1}{2}$ feet. Between the angles there were nine chapels of a round figure, designed for so many deities: and over the gate there was a statue of Minerva. The Pantheon of Athens was in many respects little inferior to that of Rome, built by Agrippa. The Greek Christians converted it into a church, dedicated to the Virgin, under the name of *Panagia*. The Turks changed it into a mosque.

The Pantheon of Nismes, was a temple in that city, in which were twelve niches, for statues, supposed to have been destined for the twelve great gods.

In the Escorial is a magnificent chapel, called Pantheon, thirty-five feet in diameter, and thirty-eight high, from the pavement, which is of marble and jasper inlaid. The whole inside of the chapel is of black marble, except the luthern, and some ornaments of jasper, and red marble.

In this chapel are deposited the bodies of the kings and queens: there are only places made for twenty-six; eight of which are already filled.

The square of the Pantheon, or "Piazza della Rotonda" is adorned with a fountain and an obelisk, and terminated by the portico of Agrippa. This noble colonnade consists of a double range of Corinthian pillars of red granite. Between the middle columns, a passage opens to the brazen portals, which, as they unfold, expose to view a circular hall of immense extent, crowned with a lofty dome, and lighted solely from above. It is paved and lined with marble. Its cornice of white marble is supported by sixteen columns, and as many pilasters of Giotto antico: in the circumference there are eight niches, and between these niches are eight altars, adorned each with two pillars of less size, but the same materials. The niches were anciently occupied by statues of the great deities; the intermediate altars served as pedestals

for the inferior powers. The proportions of this temple are admirable for the effect intended to be produced, its height being equal to its diameter, and its dome not an oval, but an exact hemisphere. The Pantheon is the most noble and perfect specimen of Roman art and magnificence which time has spared, or the ancients could have wished to transmit to posterity. It has served in fact as a lesson and a model to succeeding generations, and to it Constantinople is indebted for Santa Sophia, and to it Rome, or rather the universe, owes the unrivalled dome of the Vatican. Upon the whole this is the most ancient edifice that now remains in a state of full and almost perfect preservation. It has nevertheless undergone many alterations from pillage and reparations, chiefly restricted to its decorations. It was first altered by Domitian, and afterwards repaired by Severus. The pillars, pilasters, and marble lining remain nearly as they were placed by the latter. It was plundered of part of its bronze ornaments, by Genseric, the Vandal monarch of Africa, and afterwards more completely stripped of all its metal decorations by Constantine, the grandson of Heraclius, in the 7th century. It was converted into a church by pope Boniface IV., about the year 609, and since that period has attracted the attention and enjoyed the patronage of various pontiffs. Although the Pantheon probably owes its preservation to its having been converted into a church; yet, leaving to it its principal character as a temple, it seems better adapted to the purposes of a mausoleum; and it has actually been in some degree appropriated to this use; for it contains at present the tombs or rather the bulks of several distinguished characters, among which are the celebrated antiquary Winckelman, Metastasio, Mengs, Poussin, Hannibal Carracci, and Raffaello himself. Two musicians also, Corelli and Sacchini, have been admitted to the honours of the Pantheon.

The dedication of this church on the 1st of November, in the year 830, gave occasion to the institution of the festival of All Saints.

PANTHEON, in England, a modern building erected in Oxford-street, London, begun in 1763, and finished in 1771, for concertos and other musical performances. It was built by Mr. James Wyatt, and regarded, both by natives and foreigners, as the most elegant structure in Europe, if not on the globe. This splendid and elegant edifice was opened as a place of public entertainment, on Monday, January 27, 1772. During the first winter there were assemblies only, without dancing or music, three times a-week. On other days, each person paid five shillings for seeing the building only. But the great room, though spacious, was so crowded on all these occasions, that in July, a general meeting of the proprietors was advertised, in order to take into consideration the enlarging of the building.

After the opera-house in the Haymarket was burnt down in 1790, this master-piece of architecture was transformed into a theatre for the performance of operas; when, though many of its internal beauties were hidden and annihilated, it still was a perfect model of a complete theatre in its new form. But unhappily, before it had been used as a lyric theatre two seasons, it was burnt down by some fatal accident or design, which has never yet been divulged to the satisfaction of the public.

During its pre-existent state, it was here that the Agujari and Pacchierotti exercised their talents; it was here that the king, queen, and royal family, with all the first nobility in the kingdom, assembled, at the commemoration of Handel in 1784; and it was here that one of the first bands in Europe graced the orchestra, alternately headed by Giardini, La Motte, Cramer, or Giornovich, who, with Fifeher, Crofdil,

Crofdil, Cervetto, &c. produced effects in symphonies, concertos, solos, and vocal accompaniments, which had never before been heard in this country. No persons of taste in architecture, or music, who remembers the Pantheon. its exhibitions, its numerous, splendid, and elegant assemblies, can hear it mentioned without a sigh!

PANTHER, in *Zoology*. See *FELIS Pardus*, *Leopardus*, and *Uncia*.

PANTHER CREEK, in *Geography*, a river of Kentucky, which runs into the Green river, N. lat. 37° 29'. W. long. 84° 48'.

PANTHERA LAPIS, in *Natural History*, the name of a species of stone found in Egypt, and the East Indies, and described to be of a yellowish colour, variegated with dusky spots of the colour of those on the skin of the panther. The writers of the middle ages have attributed many absurd properties to it: it seems to have been a species of agate.

PANTHERINE TABLES, *Pantherine Mensæ*, among the Romans, tables made of citron wood, which were held in such high esteem, as to equal the value not only of silver and gold, but likewise of pearls. They had this name from their being spotted after the manner of panthers.

PANTICAPÆA, in *Ancient Geography*, a town of the Tauric Chersonesus, according to Ptolemy and Strabo. This town became the capital of the kingdom of Cimmerian Bosphorus. Under the successors of Spartacus, according to Diodorus Siculus, Panticapæa was the place where the waters of the Palus Mæotis discharged themselves into the Euxine sea.

PANTICAPES, a river of European Scythia. According to Pliny it separated between the Nomades and the Georgians. Herodotus says that it took its rise from a lake situated towards the north, that it pursued a S.W. course and passed by Ilæa, which was the first country which those enter who have traversed the Borysthenes, near the sea. He adds that Panticapes ran into the Borysthenes, a little above the mouth of this large river. Strabo, however, does not mention a river of this name; he might indeed have omitted it, and it might be the river now known under the name of Samara.

PANTICOSA, in *Geography*, a town of Spain, in Aragon; 13 miles N.N.E. of Jaca.

PANTICUM, or PANTICHUM, in *Ancient Geography*, a town of Asia, in Bithynia, between Chalcedon and Libyssa, according to the Itinerary of Antonine.

PANTIKA, in *Geography*, a town of Asiatic Turkey, in Natolia, on the N.E. coast of the sea of Marmora; 12 miles S.E. of Constantinople.

PANTIN, a town of France, in the department of the Seine, and chief place of a canton, in the district of St. Denis. The place contains 1172, and the canton 10,932 inhabitants, on a territory of 57 $\frac{2}{17}$ kilometres, in 12 communes.

PANTIPIOLIS, in *Ancient Geography*, a town of India, on this side the Ganges, between Berderis and Adirama. Ptolemy.

PANTOMATRIUM, a promontory on the N. coast of the isle of Crete, between the promontory Dion and the town Rithymac. Ptolemy.

PANTOMIME, Παντομιμοί, among the *Ancients*, a person who could imitate all kinds of actions and characters by signs and gestures, without speaking.

The pantomimes made a part in the theatrical entertainments of the ancients; their chief employment was to express, in gestures and action, whatever the chorus sung,

changing their countenance and behaviour as the subject of the song varied.

They were very ancient in Greece, being derived from the heroic times, according to some; but however this may be, they were certainly known in Plato's time. In Rome it was so late as the time of Augustus before they made their appearance. Under his reign and that of Tiberius, the pantomime, carried on by much gesticulation, was the favourite entertainment of the public. The people were moved, and wept at it, as much as at tragedies; and the passion for it was so strong, that laws were obliged to be made for restraining the senators from studying the pantomimic art.

As to the dress, it was various, being always suited, as near as possible, to that of the person they were to imitate. The crocota was much used among the Roman pantomimes, in which, and other female dresses, they personated women. See *MIME*, *BALLET*, and *BATHYLLUS*.

PANTON, in *Geography*, a township of America, in Addison county, Vermont, on the E. side of lake Champlain, about 87 miles N. of Bennington.

PANTON-SHOE, in the management of farm and other horses, an old sort of invention contrived for the purpose of receiving the narrow and hoof-bound heels of them, in particular cases. The sponges of it are much thicker on the inside than on the outside, so that the part which rests upon the horn or hoof, runs sloping to the end, that the thickness of the inside of the shoe may bear up the heel, and throw or push it to the outside. Shoes of this kind were recommended by Guillet as proper for horses which had false quarters.

PANUCO, in *Geography*, a river of North America, which runs into the gulf of Mexico; 21 miles E.S.E. of Panuco. N. lat. 22° 40'. W. long. 98° 36'.

PANUCO, or *St. Stilvara del Puerto*, a town of Mexico, and capital of the province of Guasteca or Panuco, on a river of the same name, navigable for barks up to the town. It is the see of a bishop, and contains about 500 families; 190 miles N.N.E. of Mexico. N. lat. 23° 23'. W. long. 99° 6'. See *GUASTECA*.

PANUCO, a town of South America, in the province of Tucuman; 15 miles W. of St. Fernando.

PANVILAO, a town on the S. coast of the island of Luçon. N. lat. 14 2'. E. long. 121° 36'.

PANVINIO, ONOFRIO, in *Biography*, a very learned historian and antiquary, was born at Verona in the year 1529. From a very early period of his life he manifested an insatiable thirst for study, and to indulge it he entered into the order of the Augustines. He was sent to Rome to complete his studies, and in 1553 he was appointed to instruct novices in the sciences. After a few months' residence in Rome, he was sent to Florence to teach scholastic theology, but that science not being adapted to his taste, he quitted his charge, and obtained permission to live at large out of the cloister. He passed some time at Venice, where he printed one of his works, but his ordinary abode was at Rome, being patronized by cardinal Marcello Cervini, whose pontificate, under the name of Marcellus II., was of too short duration to contribute to his advancement. From thence he passed into the court of cardinal Alexander Farnese, with whom he travelled into Sicily in 1568, where he died. "Very few instances," says his biographer, "are to be met with of such extensive erudition, and indefatigable industry, left by one whose career was restricted to such narrow limits. Besides his published works, which form a numerous catalogue, he left a still greater number in MS. either completed

er begun." One of the first objects of his labours was Roman history and antiquities. The "Fasti Consulares," though first brought to light by Sigonius, were published and illustrated with notes by him at Venice in 1557. He published treatises also, "De Antiquis Romanorum Nominibus;" "De Principibus Romanis;" "De Republica;" "De Triumphis et Ludis Circensibus;" and "Topographia Romæ." These valuable works are founded in a great measure upon ancient inscriptions, of which he had collected and copied nearly three thousand. He was a profound investigator of sacred or Christian antiquities. Of his published works in this class are treatises "De Ritu sepeliendi mortuos apud veteres Christianos;" "De Antiquo Ritu baptizandi Catechumenos;" "De Primatu Petri;" "Chronicon Ecclesiasticum;" "De Episcopatus Titulis, et Diaconis Cardinalium;" "Annotationes et Supplementa ad Platinam de Vitis Pontificum;" "De Septem præcipuis Urbis Romæ Basilicis;" "De Bibliotheca Vaticana." He had undertaken a general ecclesiastical history, for which he collected matter sufficient to fill six large manuscript volumes, which are preserved in the Vatican. He wrote a Chronicle of his own order, and a history of his native city, Verona, including an account of its antiquities, printed many years after his death.

PANWELL, in *Geography*, a town of Hindoostan, in Visiapour; 60 miles W.N.W. of Poonah.

PANYASUS, in *Ancient Geography*, a river of Macedonia, the mouth of which is placed by Ptolemy between Dyrhachium and the mouth of the river Apfus.

PAZA, or PENGGA, in *Geography*, a town of Africa, in Congo, in the province of Bamba.

PANZANO, a town of Etruria; 14 miles S. of Florence.

PANZEN, a town of Bohemia, in the circle of Leitmeritz; 15 miles N.N.E. of Leitmeritz. N. lat. 50° 44'. E. long. 14° 25'.

PANZERA, in *Botany*, named by Willdenow in honour of Dr. G. W. F. Panzer, a physician at Nuremberg, author of some well known tracts on Botany and Entomology. This genus was originally called *Eperua* by Aublet, and is considered by Schreber as not distinct from *Dimorpha*, though Willdenow says it is perfectly different in its stamens and legume, as well as in other particulars.—Willd. Sp. Pl. v. 2. 540. (*Eperua*; Aubl. Guian. v. 1. 369. Juss. 349. Lamarck Illustr. t. 338.)—Class and order, *Decandria Monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, cloven into four, broad, oblong, obtuse, concave segments. Cor. Petal one, broad, spreading, roundish, convolute at the sides of its base, inserted at the mouth of the calyx. Stam. Filaments ten, very long, variously inflexed, inserted into the calyx, thicker at the base, villose, nine of them united at the bottom, one single; anthers oblong, obtuse, two-celled, nodding, five of them barren. Pist. Germen superior, stalked, nearly ovate; style very long, incurved; stigma obtuse. Peric. Legume coriaceous, compressed, rather downy, rusty, long, hooked, with an acute, incurved point, of one cell and two valves, bursting elastically. Seeds three or four, large, compressed, coriaceous, sometimes emarginate on one side.

Ess. Ch. Calyx of one leaf, four-cleft. Petal one, lateral, convolute at the base. Filaments thickened at the base, bearded, five of them abortive. Legume.

1. *P. falcata*. Willd. (*Eperua falcata*; Aubl. Guian. t. 142.)—Native of woods, and banks of rivers, in Guiana. It flowered and bore fruit towards winter.—The trunk of this large tree is sixty feet in height, much branched at the

upper part. Branches widely scattered. Leaves alternate, pinnate; leaflets in three pairs, opposite, nearly sessile, ovate-oblong, acute, smooth, entire, springing from the furrow of the leaf-stalk. *Stipulas* two, small, deciduous. *Flowers* numerous, red. See *DIMORPHA Falcata*.

As there is so much diversity of opinion about this plant, we have thought it best to exhibit Willdenow's view of it, though it had been already mentioned under *DIMORPHA*.

PANZY. See *VIOLA*.

PAO, in *Geography*, a river of South America, which rises near Valencia, in the province of Caraccas, and after a course of about 100 miles, joins the Bariquicemeto, in N. lat. 8° 20'; and the united streams form the Portuguesea.—Also, a town of Corea; 30 miles S.E. of Ou-tchuen.

PAO-DE-NAO, a town on the coast of Africa, near the river Camarones, belonging to the Portuguese.

PAO-KING, a city of China, of the first rank; in Hou-quang. N. lat. 27° 4'. E. long. 111°.

PAOLI, PASCAL DE, in *Biography*, a very distinguished character in modern times, born at Rostino, in the island of Corfica, in 1726, was the son of Giacinto Paoli, who had been always attached to the popular cause, and who, when all his attempts against the Genoese had proved unavailing, had retired with his family to Naples. Pascal was educated among the Jesuits, and at their college he made a rapid progress in his studies, and displayed an understanding equally solid and capacious. He appears to have been formed by nature with powers capable of attaching to himself the hearts and suffrages of his countrymen; for his deportment was grave and prudent, and his judgment was matured by reflection rather than by age, while his patriotism was unquestioned, and his eloquence superior to that of any of his rivals. He was accordingly unanimously chosen generalissimo, in a full assembly of the people, when he had attained but to the 29th year of his age. He was not long in deciding how he should act: he complied with his country's call, and devoted himself to its service. Having taken leave of his father, now advanced in years, he embarked for the island, and was formally invested with the chief command. The situation of the island, in respect to its internal government, being exceedingly unpromising, this chief new-modelled the laws, and established the appearance, if not the reality, of subordination: he instituted schools, and laid the foundation of a maritime power. In 1761 the government of Genoa, perceiving the change lately effected among the natives, sent a deputation to a general council, convoked at Vecovato, for the express purpose of proposing terms of accommodation; but it was unanimously resolved never to make peace with the oppressor, unless upon the express condition of Corfica being guaranteed in the full enjoyment of its independence. A memorial to the same effect was also addressed, at the same time, to all the sovereigns of Europe. But appeals to the principles of freedom were not likely to obtain favour in royal cabinets, and nothing was gained by the memorial of the Corficans: indeed the court of France entered into a treaty with the Genoese, for supplying them with a force to garrison the towns yet remaining in their hands. The presence of the French soldiers effectually prevented any progress towards freeing the island, and the only military transaction of any note that took place during the four years in which this treaty subsisted, was the conquest, by the Corficans, of the isle of Capraia.

At length, in 1768, the Genoese despairing of rendering the stubborn islanders subservient to their will, transferred the sovereignty of Corfica to France, on condition of receiving in lieu of it 40,000,000 of livres. This was a thunderstroke to the wretched Corficans, but the noble leader remained

firm

firm to his cause: he roused and prepared the spirit of his followers for a fresh contention, and animated them to persevere, with additional zeal, in defence of their rights and liberties as an independent people, promising never to abandon them, but either to triumph or fall at the head of his countrymen. This heroic resolution was circulated with rapidity, and, when coupled with the justice of the cause in which he had embarked, obtained for him the esteem and regard of every lover of freedom and humanity throughout Europe.

He was at first tempted with the offer of being confirmed in his supreme authority, provided he would consent to hold it under the French government, but he rejected the proposal with indignation: he was a lover of liberty, and not attached to the mere exercise of power; and he nobly declared, in answer to the disgraceful application, as he thought it, that "the rocks which surrounded him should melt away, ere he would betray a cause which he held in common with the meanest Corsican." A rigorous war commenced, in which, for some time, the French were beaten, and in one instance their general was obliged to capitulate, with all his infantry, artillery, and ammunition. An immense force was now sent from France which overwhelmed the Corsican patriots; they were defeated with great slaughter, and Paoli, left with only about 500 men, was surrounded by the French, who were anxious to get possession of his person; he, however, cut his way through the enemy, and escaped to England with his friends, where they were received with all the sympathy and respect due from freemen to patriots who had so nobly supported the cause of liberty. Dumourier, who afterwards made a figure in the revolution of his own country, and was at length deservedly disgraced, served at this period against the Corsicans, with the rank of adjutant-general; and in his own memoirs, published a few years since, he pays very high compliments both to the people of the island and their chief: "it is astonishing," he says, "that this handful of islanders, destitute of artillery, fortifications, magazines, and money, should have kept France at bay during two campaigns, although she had no other enemy to cope with. But liberty doubles the valour and strength of man."

The case of the oppressed Corsicans had excited much interest in this country, and it was but a few days before his final retreat, that he received a liberal subscription from a number of private individuals, of which number were aldermen Beckford and Trecothick, and Samuel Vaughan, esq. who were also trustees for the sums raised, for the express purpose of enabling him to carry on the war against France. On his arrival Paoli was introduced at court, and the duke of Grafton, then prime minister, obtained for him a pension of 1200*l.* a-year, which he liberally shared with his companions in exile.

From this time the ex-general lived a retired life, devoting himself chiefly to the cultivation of literature. During his retirement, which lasted more than twenty years, he was introduced to Dr. Johnson by Mr. Boswell, who had visited the general while he was in Corsica; and who speaks of the interview with pleasure, saying, "the general spoke Italian, and Dr. Johnson English, and understood one another very well, with a little aid of interpretation from me, in which I compared myself to an isthmus, that joins two great continents."

At length the revolution that promised to raise France to the rank of a free state, extended its influence to Corsica, and the national convention passed a decree by which that island was numbered among the departments of France, and entitled to all the privileges of the new constitution. The return of Paoli to the dignified station of its chief, was the

first wish of his liberated countrymen, and Paoli could not resist their entreaties, which were enforced by the solicitations of the French assembly. He resigned his pension from the English court, took a grateful leave of the country in which he had been so hospitably entertained, and in the month of April 1790, presented himself at the bar of the national assembly at Paris, together with the Corsican deputies. Soon after this he embarked for Corsica, where he was received with an extraordinary degree of attachment and respect. He was elected mayor of Bastia, commander-in-chief of the national guard, and president of the department; and, in short, he at once acquired more authority in the island, than before its subjugation by the French. He was, however, not quite contented; he was ambitious of seeing Corsica wholly independent, which, upon the execution of Lewis XVI., was the prevailing wish of the Corsicans. The convention was soon apprized of their views, and summoned Paoli to their bar to justify himself against the charges exhibited against him: to gain time, he pleaded his age and infirmities as excuses why he could not comply with their demand. To a second order, more peremptory than the first, he replied in a different manner, and with more frankness. After this he repaired to Corte, the ancient capital, in the centre of the island, where, surrounded by his friends and adherents, he laughed at the proclamation which had been issued, declaring him a traitor, and setting a price upon his head. Sensible, however, that it would be impossible for a small island permanently to withstand the power of France, without foreign support, he resolved upon an expedient, which, though it was a renunciation of independence, promised to secure all the advantages of real liberty. This was an union of Corsica with the crown of Great Britain; the particulars of this business will be found in the article *CORSICA*. Paoli, as will be seen in that article, returned to England, having unfortunately lost all his property, by the failure of a mercantile house at Leghorn, and passed the remainder of his life in great privacy. He died in London, February 5, 1807, in the eighty-first year of his age. Few foreigners, however distinguished, have been so much caressed in England as general Paoli. By living in habits of familiarity with men of letters, his name and exploits acquired high celebrity: and Boswell, Goldsmith, Johnson, and many others, equally eminent in the literary world, although differing in almost every thing else, cordially united in his praise. On the continent his reputation was greatly respected: it was usual to compare Paoli to Timoleon and Epaminondas. He was unquestionably a great man; but it is the opinion of those who have enjoyed the opportunity of studying his character, that he was a politician rather than a soldier: that he shone more in council than in arms; and that the leading feature of his public conduct was a certain degree of Italian policy, which taught him to refine and speculate on every event. Boswell's Account of Corsica. Athenæum, vol. i. Monthly Mag. vol. xxiii.

PAOLO, AGOSTINO, a learned ecclesiastical composer of music, scholar of Bernardo Nanini, and successor in the pontifical chapel to Soriano. Antimo Liberati speaks of him as one of the most scientific and ingenious composers of his time, in every species of music then cultivated: and tells us, that while he was maestro di capella of St. Peter's church at Rome, he astonished the musical world with his productions for four, six, and eight choirs or chorusses; some of which might be sung in four or six parts only, without diminishing or enervating the harmony. Padre Martini, who bears testimony to the truth of this eulogium, has inserted an *Agnus Dei*, in eight parts, of this composer, which is truly a curious production: three different canons

being carried on at the same time, in so clear and natural a manner, both as to melody and harmony, that this learned father, who had been long exercised in such arduous enterprises, speaks of it as one of the greatest efforts of genius and learning in this most difficult kind of composition.

PAOLO, in *Commerce*, a small silver coin at Florence, Rome, and other places in Italy. As a money of account at Florence, the feudo d'oro is worth $7\frac{1}{2}$ lire, $11\frac{1}{2}$ paoli, or 90 crazie. The ducato, or feudo corrente, called also the piastra, is an imaginary coin, valued at 7 lire, $10\frac{1}{2}$ paoli, or 84 crazie; the lira = $1\frac{1}{2}$ paoli; the paolo or giulio = 8 crazie = 40 quatrini = 160 denari di lira; a tellone = 2 lire = 3 paoli.

The coins in silver are pieces of 10 paoli, or $6\frac{1}{2}$ lire, called francefconi and leopoldoni; half ditto, called francefchini, of 5 paoli; tallari, of 6 lire, or 9 paoli; tefconi of 2 lire, or 3 paoli; single, half, and quarter lire, of 20, 10, and 5 foldi; double, single, half, and quarter paoli; double, single, and half crazie.

The piece called francefcone weighs 23 denari 10 grani, Florence weight, or 426 English grains; and the silver is 10 denari 22 grani, or 10 oz. $18\frac{1}{2}$ dwts. fine; and therefore contains $387\frac{1}{2}$ English grains of fine silver, or 419 grains of standard silver, and is worth 4s. 6d. sterling. According to this valuation, the feudo d'oro, of $7\frac{1}{2}$ lire, = 5s. $0\frac{3}{4}$ d. sterling; the ducato, or feudo corrente, of 7 lire, = 4s. $8\frac{3}{4}$ d. sterling; the pezza, of $5\frac{1}{2}$ lire, = 3s. $10\frac{3}{4}$ d. sterling; the lira is worth about 8d.; or 1l. sterling = 29 lire, 12 foldi, 7 denari, or 4 ducati, 4 foldi, 7 denari di ducato; or 5 pezze, 2 foldi, 8 denari di pezza, all in silver. For the paoli of Rome, see ROME.

PAOLO, *St.*, in *Geography*, a river of Sicily, which runs into the sea, on the E. coast, N. lat. $37^{\circ} 16'$. E. long. $15^{\circ} 13'$.—Also, a small island, near the coast of Naples, in the gulf of Taren'to. N. lat. $40^{\circ} 42'$. E. long. $17^{\circ} 6'$.—Also, a town of Naples, in the Capitanata; 3 miles S.E. of Dragonera.

PAOLOS, in *Geography*, a town of Asiatic Turkey, in the province of Sivas; 25 miles W. of Sivas.

PAON, in *Ornithology*. See TRINGA *Pugnax*, and PAVO *Cristatus*.

PAO-NGHAN, in *Geography*, a city of China, of the second rank, in Pe-tche-li, on the river San-cam; 62 miles N.W. of Pekin. N. lat. $40^{\circ} 20'$. E. long. $114^{\circ} 41'$.

PAO-NING, a city of China, of the first rank, in the province of Se-tchuen, comprehending within its jurisdiction ten cities.

PAOOM, one of the smaller *New Hebrides*; which see.

PAOS, a town of Portugal, in the province of Beira; 16 miles N.W. of Viseu.

PAO-TCHING, a town of Corea; 30 miles S. of Koang-cheou.

PAO-TCHUEN, a town of Corea; 28 miles S.S.W. of Hoang-tcheou.—Also, a town of Corea; 23 miles E. of King-ki-tao.

PAO-TING, a city of China, in the province of Pe-tche-li, in which the viceroy resides, and the most considerable in the province, next to Pekin. It has 20 others under its jurisdiction; the country round it is pleasant, and inferior in fertility to no part of China. In going from Pe-kin to the province of Chan-fi, it is necessary to pass through this city. N. lat. $38^{\circ} 54'$. E. long. $115^{\circ} 14'$.

PAOULA, a town of Naples, in Principato Ultra; 4 miles N.E. of Benevento.

PAOWAH, a town of Hindoostan, in Bahar; 5 miles S. of Bahar

PAP, in *Rural Economy*, a provincial term applied to the teats of cows, or other animals that give milk. The paps distend after the young is produced, and as the bodies of them contain the terminations of the tubuli lactiferi, where they are tortuous, and act as valves; they are distensible, as they are squeezed becoming straight, and thus the milk has a free passage, whether the pressure be caused by the mouth of the young animal in sucking, or the hand in the act of milking. See TEAT.

PAPA. See POPE.

PAPA, in *Ornithology*. See VULTUR.

PAPA, in *Geography*, a town of Hungary; 25 miles S. of Raab.

PAPA *Stour*, one of the Zetland or Shetland islands of Scotland, is situated about a mile westward from the Mainland. This island extends about two miles in length, and one in breadth. Its soil is a rich sand, producing excellent pasturage grafs, and even good crops of oats, with beans and potatoes. Along the coast are numerous small *voes*, or harbours, which afford a safe retreat to the boats employed in the Zetland islands. Here is a remarkable cave, by which the sea flows for a considerable distance into the interior of the island, under the rocks. The beach, being admirably adapted for drying fish, is occupied by a number of houses appropriated to that purpose. History of the Zetland Islands, by Dr. A. Edmonston. Sinclair's Statistical Account, vol. xx.

PAPA, or PAPAY-*Stronfay*, one of the Orkney islands, off the coast of Scotland, is situated on the north-east quarter of the isle of Stronfay. Though little more than three miles in circumference, its surface is remarkably level, and equally beautiful as fertile. Here are the ruins of two ancient chapels, one dedicated to St. Bride, and the other to St. Nicholas. On an eminence called Earl's knoll, are several graves, and some vestiges of buildings which formerly belonged to one of the ancient earls of Orkney. History of the Orkney Islands, by the Rev. Dr. Barry, 2d edit. 1808, by the Rev. James Headrick.

PAPA, or PAPAY-*Westray*, one of the Orkney islands of Scotland, lies about one mile to the north of Westray. It is nearly four miles long, and one broad; and scarcely yields in fertility of soil to any district in Scotland. At its south-eastern extremity is a beautiful lake of fresh water, the centre of which is adorned with an islet, where are the ruins of the once noble chapel of St. Tredwall, to whom superstition, till lately, attributed many wonderful and miraculous works. History of the Orkney Islands, by Dr. Barry, 3d edit. 1808.

PAPACY. See POPEDOM.

PAPAGAY, or PAPEGAY, in *Ornithology*. See PSITTACUS.

PAPAGAYO, in *Geography*, a river of Mexico, which runs into the Pacific ocean, 25 miles N. of Acapulco, N. lat. $17^{\circ} 40'$. W. long. $101^{\circ} 46'$.

PAPAGAYO *Bay*, or *Parrot Bay*, a bay on the North Pacific ocean, and on the W. side of the isthmus of Nicaragua, at a small distance from the western part of the lake of Nicaragua. N. lat. $11^{\circ} 10'$. W. long. $87^{\circ} 36'$.

PAPAKUNK, a town of New York, on the Papaciton. N. lat. $42^{\circ} 5'$. W. long. $74^{\circ} 58'$.

PAPAL CROWN is a deep cap, or mitre of cloth of gold, encompassed with three coronets, or circles of gold, adorned with flowers; and the whole enriched with precious stones; having a globe at top, finished with a cross. See CROWN.

PAPALLACLA, in *Geography*, a town of South America, in the province of Quito; 50 miles N.W. of Archidona.

PAPALOAPAIN, a river of Mexico, called Alvarade, or Alvarodo; which see.

PAPALQUIAN, a town of Mexico, in New Biscay; 130 miles N.W. of Durango.

PAPAMOW, a town of Hindoostan; 8 miles N. of Allahabad.

PAPAN, in *Ornithology*, the name given by the inhabitants of the Philippine islands, to a species of duck common in their lakes and marshes. This is very large and beautiful, and is called by father Camelli *anas regia*, or the *royal duck*: it is not so common, however, as the little kind which they call *salayafir*.

PAPANAUD, in *Geography*, a town of Hindoostan, in the Carnatic; 25 miles S.S.E. of Tanjore.

PAPAS, a lake of South America; 40 miles S. of Popayan.

PAPAS *Adassi*, or *Papadonissa*, or *Prince's Islands*, a cluster of small islands in the N.E. part of the island of Marmora, at the entrance of the Straits of Constantinople; 8 miles S. of Constantinople. The islands known under the name of Prince's islands, are nine in number, four large, and five small. The first is called "Prota;" the second, "Antigona;" the third, "Chalkis;" and the fourth, "Prinkipos:" to the south of the latter lies the little island, called "Rabbit" island; to the west are two small islands, one of which is known by the name of "Oxya," and the other by that of "Plata;" the two others are nameless rocks. The principal of these islands is *Prinkipos*; which see.

PAPAS-ILI, a town of European Turkey, in Romania; 32 miles N. of Adrianople.

PAPAYER, in *Botany*, the Poppy, so called, according to the most learned etymologists, because it was commonly mixed with the pap, *papa*, given to children, in order to procure sleep. This plant and its name have ever been associated with the idea of sleep in most languages, in poetry and philosophy, in history and fable. Its juice is still the best opiate known, and in the most general use.—Linn. Gen. 263. Schreb. 350. Willd. Sp. Pl. v. 2. 1144. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 565. Prodr. Fl. Græc. Sibth. v. 1. 358. Ait. Hort. Kew. ed. 2. v. 3. 288. Juss. 236. Tourn. t. 119, 120. Lamarck Illustr. t. 451. Gærtner. t. 60.—Class and order, *Polyandria Monogynia*. Nat. Ord. *Rhæadææ*, Linn. *Papaveraceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, ovate, emarginate, of two nearly ovate, concave, obtuse, immediately deciduous leaves. *Cor.* Petals four, roundish, flattish, spreading, large, contracted at the base, alternately smaller. *Stam.* Filaments numerous, capillary, inserted into the receptacle, much shorter than the corolla; anthers oblong, compressed, erect, obtuse. *Pist.* Germen superior, sessile, large, roundish; style none; stigma depressed, peltate, flat, radiated. *Peric.* Capsule oval, or somewhat oblong, crowned with the large, flat, permanent stigma, of one cell, though imperfectly divided into many, bursting at the top by numerous orifices under the stigma. *Seeds* numerous, minute. *Receptacles* longitudinal folds, attached to the inside of the capsule, equal in number to the rays of the stigma.

Eff. Ch. Calyx of two leaves. Petals four. Stigma radiated. Capsule superior, of one cell, opening by pores under the permanent stigma.

Obs. The seed-vessel differs in shape in different species, from globose to oblong, and the rays of the stigma differ greatly in number, according as the shape of the capsule appropriated to each species, is more or less oblong and narrow. The species are commodiously divided into two sections, distinguished by the roughness or smoothness of the capsule.

SECT. 1. Capsules bristly.

1. *P. hybridum*. Mongrel Poppy. Linn. Sp. Pl. 725. Engl. Bot. t. 43. (*Argemone capitulo torulo*; Ger. em. 373.)—Capsule nearly globular, furrowed, bristly. Stem leafy, many-flowered.—Native of fields, on a light soil, in the more temperate or southern parts of Europe; rare in England, though we have several times gathered it sparingly about Norwich. The root is annual. Stem branched, about a foot high, leafy, covered with close-pressed bristles. Leaves dark green, alternate, doubly pinnatifid, in many narrow segments, bristly like the stem. Flowers terminal, solitary, erect, smaller than usual in the genus. Calyx rough with tawny hairs. Petals deep red, with more or less of a violet spot at the base. Stamens violet. Pollen bright blue. Capsule the size of a filbert, deeply channelled, obovate, belet with ascending prickles. The whole herb partakes of the fetid and disagreeable flavour common to its genus, but is scarcely milky.

2. *P. Argemone*. Long rough-headed Poppy. Linn. Sp. Pl. 725. Curt. Lond. fasc. 5. t. 38. Engl. Bot. t. 643. Fl. Dan. t. 867. (*Argemone capitulo longiore*; Ger. em. 373.)—Capsules club-shaped, bristly. Stem leafy, many-flowered.—Native of sandy fields, in various parts of Europe, flowering in June or July. Much like the last, but the segments of the leaves are generally broader, and the colour of the whole herb, as well as of the flowers, is lighter. The bristles of the stem are not so closely pressed. Stamens very broad at their summit, each anther being supported by a little partial stalk. Stigma with only four or five rays, the capsule being slender, obscurely five-sided, by no means channelled like the former, nor is it so bristly, except in the upper part. The flowers have been found double in England, but such a circumstance is rare. Both these species occur but sparingly, in a scattered manner, and never in the abundance of the common *P. rhæas* hereafter described, let the soil and situation be ever so favourable.

3. *P. alpinum*. Alpine Poppy. Linn. Sp. Pl. 725. Jacq. Austr. t. 83. Seguier. Veron. 416. t. 4. f. 4.—Capsule bristly. Stalk radical, single-flowered, bristly, leafless. Leaves doubly pinnate.—Native of the mountains of Switzerland, Austria, the rocks of mount Baldus, Dauphiny, and the Pyrenees. Miller appears to have cultivated this species in 1759, but it is now rarely to be seen with us. Though tolerably hardy, it thrives best in a frame, flowering in May or June. Root perennial, tasted. Leaves numerous, all radical, stalked, doubly pinnatifid, the segments linear or obovate, decurrent, entire, rather glaucous, smooth, or slightly hairy. Flower-stalks few, ascending, simple, five or six inches high, bristly, with close hairs, leafless, each bearing one flower, about an inch and half broad, usually pale yellow, sometimes, according to Villars, reddish or whitish; Jacquin says it is constantly pure white in Austria. The anthers are always yellow. Capsule ovate, bristly, with four, five, or six angles in the upper part, and as many rays to the stigma.

4. *P. nudicaule*. Naked-stalked Poppy. Linn. Sp. Pl. 725. Fl. Dan. t. 41. (*P. erraticum nudicaule, flore flavo odorato*; Dill. Elth. 302. t. 224.)—Stalk radical, single-flowered, bristly, leafless. Leaves simple, pinnatifid.—Native of Norway and Siberia. More frequently seen in our gardens than the last, being a hardy biennial, flowering in June and July. The leaves differ from the last in being simply pinnatifid, and their segments much broader. The stalk is a foot high. Flower of a most decaute sulphur colour, but with a disagreeable smell, at least in our opinion, Dillenius nevertheless compares it to the scent of a Jonquil.

and

PAPAYER.

and says it is chiefly perceptible in a morning and evening. Linnæus considered the two species last described as too nearly related to each other, but they seem distinct, notwithstanding the agreement in their habit, the hairy calyx, and ovate bristly seed-vessel. The present is said to have occasionally a white flower.

SECT. 2. Capsules smooth.

5. *P. Rhæas*. Common Red Poppy, or Corn Rose. Linn. Sp. Pl. 726. Curt. Lond. fasc. 3. t. 32. Engl. Bot. t. 645. Woodv. Med. Bot. t. 186. Ger. em. 371. (*P. erraticum*; Matth. Valgr. v. 2. 404.)—Capsules smooth, nearly globular. Stem many-flowered; rough with horizontal hairs. Leaves pinnatifid, cut.—Native of cultivated and waste ground, throughout Europe, and a very troublesome, though splendid weed in ill managed corn-fields. It flowers in Greece in the early spring, with us not till June or July. The root is annual. Stem about two feet high, branched, clothed all over with bristly hairs, that all spread horizontally. Leaves pinnatifid; often in some degree bipinnatifid; their segments oblong, serrated, and cut, more or less hairy. Flowers larger than in any of the foregoing, of a deep and most brilliant scarlet red, slightly fœtid. Capsule quite smooth and even, short and abrupt, with a many-rayed stigma.

Varieties with more or less double flowers, white, red or parti-coloured, are common in gardens, but if suffered to scatter their seed without a careful renewal of soil, their beauties and distinctions are transient in their offspring. The heads or capsules of this species are recommended as an opiate by Dioscorides, and its use is still retained; especially a red syrup is made of the flowers, which serves as a mild soporific for children.

6. *P. dubium*. Long smooth-headed Poppy. Linn. Sp. Pl. 726. Curt. Lond. fasc. 5. t. 37. Engl. Bot. t. 644. Fl. Dan. t. 902.—Capsules smooth, oblong. Stem many-flowered, hairy; the hairs on the flower-stalks close-pressed. Leaves doubly pinnatifid.—Native of fields in various parts of Europe, chiefly on a sandy soil, and not very abundantly, flowering in June and July. This approaches the last very nearly in habit, but the flowers are of a paler hue, the capsule slender, furrowed, with a stigma of only six or eight rays, and the bristles on the flower-stalks are closely pressed to the stalk, not spreading as in *P. Rhæas*. Crantz thought this species a variety of *P. Argemone*, but there seems little reason for such an opinion. *P. dubium*, Jacq. Austr. t. 25, if correctly drawn, is very puzzling. The bristles on the flower-stalks are represented deflexed, which is quite the reverse of our Linnæan specimen, as well as of the English ones; the petals are white, with a violet spot.

7. *P. somniferum*. White, or Garden, Poppy. Linn. Sp. Pl. 726. Woodv. Med. Bot. 185. Engl. Bot. t. 2145. Bulliard. t. 57. (*P. sylvestre*; Ger. em. 370.)—Calyx and capsules smooth. Leaves embracing the stem, glaucous, cut. Stem smooth in the lower part; rough with spreading hairs above.—Native of fields and waste ground in the south of Europe; rare in England. The Rev. Mr. White observed it to be truly wild on the sandy banks of the fen ditches in Marshland. In gardens it is well known, as a hardy annual, sporting in the forms and colours of its rich beautiful double petals, but easily returning, if neglected, to its single state, and pale purple or white hue, having a violet stain on each petal. The largest heads, for medical use, are obtained from the single-flowered kind, cultivated in warm countries on a fertile soil. These being wounded as they grow, yield a milky juice, which by drying becomes opium. The herb is erect, four feet or more in

height, branched, very glaucous, with broad, obtuse, simple, lobed and crenate, wavy leaves, clasping the stem, which in its upper part only is naturally clothed with coarse spreading hairs. The buds droop, but the flowers are erect, with a faint unpleasent scent, a smooth calyx, large petals, and a nearly globose capsule, crowned with a stigma of many rays. The seeds are either dark brown or white, of a pleasant sweet flavour.

8. *P. pilosum*. Hairy Red Poppy. Sm. Prodr. Fl. Græc. Sibth. v. 1. 360. Fl. Græc. t. 492, unpublished.—Capsules smooth. Stem many-flowered, clothed with spreading hairs. Leaves clasping the stem, cut, hairy all over.—Gathered by Dr. J. Sibthorp, about the Bithynian Olympus. The root of this new and handsome species appears to be perennial. Herb about the size of the last, but of a bright green, not glaucous, and clothed with bristly hoary hairs, which spread horizontally on the stem, where they are very abundant, as well as on the flower-stalks, where they are sparingly scattered. The leaves are simple, broad, heart-shaped, and clasping the stem, bluntly lobed and cut, hairy, with strong ribs and veins; the radical ones narrower, oblong, and stalked. Flowers about the size of the last, and indeed larger than the wild *P. somniferum* of Greece, drooping in the bud, then erect. Calyx bristly. Petals of a pale tawny scarlet, or full orange, with white claws. Anthers yellow. Germen obovate, smooth, glaucous, with six ribs, and the same number of broad rays in the stigma.

9. *P. virgatum*. Wand-like Poppy. (*P. orientale*, tenuiter incisum, ad caulem floridum; Tourn. Cor. 17.)—Capsules smooth. Stem straight, panicled, many-flowered, rough with spreading bristles. Leaves pinnate, cut, bristly.—Native of Armenia. We described it formerly from Tournefort's herbarium at Paris. The stem is straight and stiff, panicled, bearing a great number of flowers, and clothed with spreading rigid bristles. Radical leaves numerous, pinnate, cut, hispid, especially their ribs, all the points callous, and tipped with a bristle, as in those of *P. orientale*, which they in all respects much resemble. Flower-stalks scattered, each bearing one, two, or three flowers. Calyx bristly. Petals red. Germen roundish, smooth. This species differs from the following one, in having a straight, panicled, many-flowered stem, the bristles covering which are horizontal, not close-pressed.

10. *P. orientale*. Great Oriental Poppy. Linn. Sp. Pl. 727. Curt. Mag. t. 57. (*P. orientale hirsutissimum*, flore magno; Tourn. Cor. 17. Voy. v. 2. 118. t. 118. Comm. Rar. t. 34.)—Capsules smooth. Stem single-flowered, leafy, rough, with close-pressed bristles. Leaves pinnate, serrated, bristly.—Native of the Levant. Tournefort found it near Erzerum, in Armenia, flowering in June. He introduced it into the gardens of Holland and France, and it has been, for about a century, a hardy perennial in our parterres, flowering early in summer, and very conspicuous for the great size, and peculiarly brilliant scarlet colour of its flowers, which are too dazzling to be looked on in the sunshine. They are nearly a span wide, with dark stamens, and sometimes a black spot on each petal. Germen globose, quite smooth and even, without ribs. Rays of the stigma sixteen, peculiarly dilated. The root creeps moderately, by which the plant is increased, for it scarcely ever ripens seed with us. Stems about two feet high, simple, leafy, round, densely clothed with erect, rigid, pungent, close-pressed bristles. Leaves most numerous from the root, a foot long, dark green, harsh and bristly, pinnate, with serrated decurrent segments. The juice of the plant is hot and acrid, yet Tournefort says the Turks and Armenians eat the unripe heads by way of luxury. They extract no opium from this species;

species; but perhaps the similarity of its flavour and effects, to that great foolher of their cares, may cause it to be thus employed.

11. *P. fugax*. Small Fugacious Poppy. Lamarek Dict. v. 5. 118.—Capsules smooth, orbicular. Stem panicled, many-flowered, smooth. Petals minute. Leaves pinnatifid, ferrated, hispid. Brought by Michaux from Persia. It flowered in May 1789, in the royal garden at Paris. Poiret described it from Lamarek's herbarium, and we know this species merely from his description, having seen neither specimen nor figure. He says it is distinguished by the *stem*, forming at the summit an ample panicle of many very small flowers, which last but a few hours. Each *stem* is slender, straight, striated, smooth, about eighteen inches high, simple, except at the top. *Leaves* scattered, stalked, not unlike those of *P. orientale*, but less deeply pinnatifid, not pinnate, furnished with a few long scattered hairs, the segments or teeth, more or less distant, each terminated by a long bristle. *Petals* pale red, very small in comparison with the rest of the genus, and extremely fugacious. *Capsule* small, globular, smooth, crowned with a conical, obtuse *stigma*, of four or five rays.

12. *P. cambricum*. Yellow Welch Poppy. Linn. Sp. Pl. 727. Engl. Bot. t. 66. (*P. cambricum* perenne, flore sulphureo; Dill. Elth. 300. t. 223. *Argemone lutea cambro-britannica*; Morif. sect. 3. t. 14. f. 12.)—Capsules smooth, oblong, beaked. Stem nearly smooth, bearing several flowers. Leaves pinnate, cut.—This species, one of the most elegant of our native plants, seems peculiar to rocky shady situations in Wales and Westmoreland; for the reference to Bauhin's Prodomus, on which Linnæus grounds his assertion of its being found on the Pyrenæes, appears to belong either to the *alpinum* or *nudicaule*. It is perennial, flowering in June; and may be cultivated in the moist shady parts of a garden, where, though each root does not, in general, last many years, the seeds scattering themselves in the undisturbed soil, will from time to time produce new plants. The *stem* is twelve or eighteen inches high, leafy, somewhat branched, clothed with a few rather upright hairs. *Leaves* tender and delicate, of a pale but pleasant green, pinnate, their common stalk winged; their leaflets ovate, acute, cut or lobed, almost entirely smooth, glaucous underneath, each above an inch long. *Flowers* terminating the few branches, solitary, on long stalks, about the size of *P. dubium*, but of a beautiful lemon colour, with a scent like those of *Craffula coccinea*, or *Mesembryanthemum nodiflorum*, which most people compare to the Bergamot Pear. The *stigma* has about five rays, and is elevated on a sort of beak, resembling a style, above the obovate, smooth, five-ribbed *capsule*. The *calyx* is hairy. The herb when wounded discharges a yellowish fluid, not unlike the juice of the common Celandine, to which indeed this plant is so nearly allied in botanical affinity, that such a coincidence is not surprizing. The same may be said of the American *Sanguinaria*.

PAPAVER, in *Gardening*, contains plants of the hardy, herbaceous, fibrous-rooted, annual, and perennial kinds, of which the species cultivated are, the white poppy (*P. somniferum*); the corn, or red poppy (*P. rhæas*); the Welch poppy (*P. cambricum*); and the Oriental poppy (*P. orientale*).

There are several varieties of the first sort, differing in the colour and multiplicity of their petals, which are preserved in gardens for ornament: the single-flowered sort is chiefly cultivated for use.

The common black variety of poppy has stalks about three feet high, smooth, and dividing into several branches; the leaves are large, smooth, deeply cut or jagged on their

edges, and embracing; the petals purple, with dark bottoms; succeeded by oval, smooth capsules filled with black seeds, which are sold under the name of *maco-seed*.

And of this there are many sub-varieties; as with large double flowers, variegated of several colours; with red and white, purple and white, and some finely spotted like carnations.

There are few plants whose flowers are so handsome; but as they have an offensive scent, and are of a short duration, they are not in general much regarded.

In the second sort there is a variety with an oval, black, shining spot, at the base of each petal, from which many beautiful garden sub-varieties are produced, which have double flowers, white, red bordered with white, and variegated.

The fourth has also a few varieties, differing in the colour of the flowers; and it is said that the flower is sometimes double, but with us it is always single.

Method of Culture.—All the different sorts may be increased by seeds, and the two last sorts also by parting and planting out the roots.

The seeds should be sown in the autumn, or very early in the spring, but the former is the better season, either in the places where the plants are to grow, or in beds, to be afterwards planted out. The first is probably the best method, as these plants do not bear removing well.

When they are cultivated for ornament, seed of the finest double sorts should be carefully provided and made use of, and be sown in patches.

In the practice of Mr. Ball, in cultivating the first sort for the purpose of preparing opium from it, "the seed was sown at the end of February, and again the second week in March, in beds three feet and a half wide, well prepared with good rotten dung, and often turned or ploughed, in order to mix it well, and have it fine, either in small drills, three in each bed, or broadcast; in both cases, thinning out the plants to the distance of a foot from each other, when about two inches high, keeping them free from weeds." They produced from four to ten heads each, and shewed large flowers of different colours. "With an instrument something like a rake, but with three teeth, the drills may be made at once." He found that the plants did not bear transplanting; as out of 4000 which he transplanted, not one plant came to perfection.

The roots of the two last sorts may be divided in the autumn or spring, but the first period is the better, leaving some root fibres to each parting, planting them out where they are to remain, as soon afterwards as possible.

In all the sorts the plants only require afterwards to be kept free from weeds, and those raised from seed properly thinned out.

They all afford ornament and variety in the clumps, borders, and other parts of pleasure grounds and gardens; and the first sort may sometimes be grown to advantage for the purpose of having the juice which it affords made into opium.

PAPAVERACEÆ, in *Botany*, a natural order of plants, the 62d in Jussieu's system, the 2d of its 13th class. This order owes its name to *Papaver*, the Poppy, the principal, and best known, of the genera that compose it. For the characters of this 13th class, see GERANIA.

The *Papaveraceæ* are thus defined. *Calyx* mostly of two leaves, soon falling off. *Petals* generally four. *Stamens* either definite or indefinite. *Germen* one; style often wanting; stigma divided. *Fruit* either capsular or siliquose, for the most part of a single cell, and generally with many seeds, which are affixed to lateral receptacles, each seed half covered with a membranous integument. *Stem* herbaceous, scarcely

ever shrubby. *Leaves* alternate. *Juice* in some instances coloured. See PAPAVER.

SECT. 1. *Stamens* indefinite; their anthers combined with the filaments. This contains *Sanguinaria*, *Argemone*, *Papaver*, *Glaucium*, *Chelidonium* and *Bocconia*; see PANKE. Surely *Aëæa* and *Podophyllum* more naturally belong to this place, than to the *Ranunculaceæ*, where Jussieu has placed them.

SECT. 2. *Stamens* definite. This section consists of *Hypocoum* and *Fumaria*; to which we would, at the suggestion of Jussieu himself, add his *Balsamina*, (*Impatiens* of Linnæus,) as more allied, at least to this order, than to his GERANIA; see that article.

Jussieu indicates the connection between this order and the *Cruciferae*, of which *Chelidonium* and *Hypocoum* are the slight and obscure links, they having, like the cruciform plants, four petals and a pod, as well as seeds destitute of albumen; but differing in having but two leaves to their calyx, and only four stamens.

PAPAW. See CARICA.

PAPAW-Tree of North America. See ANNONA.

PAPAWS, in *Geography*, a name given in the West Indies to the Negroes of Whidah, or Fida, in Africa. These are unquestionably the most docile and best-disposed slaves that are imported from any part of Africa. Without the fierce and savage manners of the Koromantyn Negroes, they are also happily exempt from the timid and desponding temper of the Eboes. The cheerful acquiescence with which these people apply to the labours of the field, and their constitutional aptitude for such employment, arise, without doubt, from the great attention paid to agriculture in their native country. Bosman speaks with rapture of the improved state of the soil, the number of villages, and the industry, riches, and obliging manners of the natives. He observes, however, that they are much greater thieves than those of the Gold Coast, and very unlike them in another respect, namely, in the dread of pain and the apprehension of death. They are, he says, so very apprehensive of death, that they are unwilling to hear it mentioned, for fear that alone should hasten their end; and no man dares to speak of death in the presence of the king or any great man, under the penalty of suffering it himself, as a punishment for his presumption. He adds, that they are addicted to gaming beyond any people of Africa. These propensities, it is said, are observable in the character of the Papaws in a state of slavery in the West Indies. That punishment which excites the Koromantyn to rebel, and drives the Eboe negroes to suicide, is received by the Papaws as the chastisement of legal authority, to which it is their duty to submit patiently. The case seems to be, that the generality of these people are in a state of absolute slavery in Africa, and having been habituated to a life of labour, they submit to a change of situation with little reluctance. Many of the Whidah negroes are found to be circumcised. Whether it be a religious ceremony common to all the tribes that go under the appellation of Papaws, has not been ascertained. It is practised universally by the "Nagoes;" a people that speak the Whidah language; but some Negroes on this part of the coast disavow the practice.

PAPAYA, in *Botany*, an Indian name, retained by Tournefort, Plumier, and Jussieu, for the *Carica* of Linnæus, or Papaw-tree. See CARICA.

PAPAZLI, in *Geography*, a town of European Turkey, in Rumania; 12 miles E.S.E. of Filippopoli.

PAPEMBERG, an island of Japan, resembling a mountain, surrounded by the sea. The Dutch ships have been accustomed to anchor here for wind, when they wish to re-

turn to Batavia. Its Japanese name is "Takaboko," or "Takajama."

PAPENBERG ISLANDS, five small islands in the East Indian sea. S. lat. 6° 54'. E. long. 131° 58'.

PAPER, a thin flexible leaf, usually white, artificially prepared of some vegetable substance, chiefly to write upon with ink.

The word is formed from the Greek *πᾶπυρος*, *papyrus*, the name of an Egyptian plant, called also *βιβλος*, *biblus*, on which the ancients used to write.

Various are the materials on which mankind, in different ages and countries, have contrived to write their sentiments; as on stones, bricks, the leaves of herbs and trees, and their rinds or barks; also on tables of wood, wax, and ivory; to which may be added plates of lead, linen rolls, &c. At length the Egyptian papyrus was invented; then parchment, then cotton paper; and, lastly, the common, or linen paper. Vide Maffei *Istor. Diplom. lib. ii. § 3. 10. Bibl. Ital. tom. ii. p. 242.* Leo Allat. *Antiq. Hetrusc. p. 127, seq. Hug. de Scrib. Origin. Alex. ab Alexand. lib. ii. cap. 30. Barthol. diss. 4. de Libr. Legend. p. 90, seq.*

In some places and ages they have even written on the skins of fishes; in others on the intestines of serpents; and in others on the backs of tortoises. (Mabill. de Re Diplom. lib. i. cap. 8. Fabric. Biblioth. Nat. cap. 21, &c.) There are few sorts of plants but have at some time been used for paper and books; and hence the several terms, *billos*, *codex*, *liber*, *folium*, *tabula*, *tillura*, *philura*, *scheda*, &c. which express the several parts on which they were written; and though in Europe all these disappeared upon their introduction of the papyrus and parchment, yet in some other countries the use of divers of them obtains to this day. In Ceylon, for instance, they write on the leaves of the talipot. And the Bramin MSS. in the Tulinga language, sent to Oxford from Fort St. George, are written on leaves of the ampana, or palma Malabarica: Hermannus gives an account of a monstrous palm-tree called *coddâ pana*, or *palma montana Malabarica*, which, about the thirty-fifth year of its age, rises to be sixty or seventy feet high, with plicated leaves nearly round, twenty feet broad; with which they commonly cover their houses; and on which they also write; part of one leaf sufficing to make a moderate book. They write between the folds, making the characters through the outer cuticle. Knox. *Hist. Ceyl. lib. iii. Le Clerc. Bibl. Univ. tom. xxiii. p. 242. Phil. Transf. N° 246. p. 422, seq. Vide Hort. Ind. Malab. p. 3. Phil. Transf. N° 145. p. 108.*

In the Maldivé islands, the natives are said to write on the leaves of a tree called *macaraquean*, which are a fathom and a half long, and about a foot broad. And in divers parts of the East Indies, the leaves of the musa arbor, or plantain-tree, dried in the sun, served for the same use, till of late that the French have taught them the use of European paper. Ray, in fine, enumerates divers kinds of Indian and American trees which bear leaves proper to be used as paper; particularly one called *xagua*, which has something in it extraordinary; its leaves are so large, and of so close a texture, that they cover a man from top to toe, and shelter him from the rain, and other inclemencies of the weather, like a cloak: and from the innermost substance of these leaves, a paper is taken; being a white and fine membrane like the skin of an egg, as large as a skin of our vellum or parchment, and nothing inferior for beauty and goodness to the best of our papers. Vide Savar. *D. de Comm. tom. ii. p. 967. Vide Ray Hist. Plantar. tom. ii. lib. 32. Nouv. Rep. Let. tom. xii. p. 361.*

Paper is chiefly made among us of linen, or hempen rags, beaten

beaten to a pulp in water, and moulded into square sheets, of the thickness required. But it may also be made of nettles, hay, turnips, parsnips, colewort-leaves, asbestus, or any thing that is fibrous; nay, it may be made of white woollen rags: though this would not serve for writing, because of the hairiness. The Chinese paper is so fine, that many of the Europeans have thought it was made of silk; not considering, says Du Halde, that silk cannot be beat into such a paste, as is necessary to make paper: but it is to be observed, that the same author afterwards speaks of a paper, or parchment, made of the balls of silk worms; and the like, we are assured by others is done at Cathay. Hought. Collect. N^o 360. tom. ii. p. 418, seq. Description of China, p. 360. seq. Vide Busbeq. Legat. Turc. Epist. iv. p. 329.

PAPER, with regard to the manner of making it, and the materials employed therein, is reducible to divers kinds: as the *Egyptian*, *European*, and *Chinese paper*: we also find mention of *cotton paper*, *bark-paper*, and *asbestine* or *incombustible paper*.

PAPER, *Egyptian*, is that which was principally used among the ancients: it was made of a rush called papyrus, or biblus, growing chiefly in Egypt, about the banks of the Nile: though it was also found in India; and Guilandinus assures us, he saw in Chaldæa, at the confluence of the Tigris and Euphrates, large fens, in which, with his own hands he plucked a papyrus differing in nothing from that of the Nile. Strabo likewise speaks of a sort of papyrus growing in Italy; but we do not find this was ever used for making paper.

The description given by Pliny of the papyrus, or paper-reed, is somewhat obscure. Its root, according to him, is of the thickness of a man's arm, and ten cubits long; from this arise a great number of triangular stalks six or seven cubits high, each thick enough to be easily spanned; its leaves are long like those of the bull-rush; its flowers staminateous, ranged in clusters at the extremities of the stalks; its roots woody and knotty like those of rushes, and its taste and smell near akin to those of the cyperus, under which genus Linnæus has classed the papyrus. (See CYPERUS.) Vide Plin. Hist. Nat. lib. xiii. cap. 11. Vide Theophr. Hist. Plant. lib. iv. cap. 9. and Delecamp, who gives us a figure of it, Hist. lib. xviii. p. 1883. See also Bauhin. lib. xviii. cap. 186, who, with Gesner, makes it a species of Cyperus. Grew Mus. Reg. Societ. p. 2. sect. 2. p. 225, seq. Maffei Ist. Diplomat. Bibl. Ital. tom. ii. p. 246.

Besides paper, they made sails, ropes, and other naval rigging; as also mats, blankets, clothes, and even ships, of the stalk of the papyrus. Moses, we are told, when a child, was exposed on the banks of the Nile, ἐν δίβλῃ πάπυρος, i. e. in a basket of papyrus. The Egyptian priests wore shoes of papyrus.

Guilandinus, a Prussian physician before mentioned, has a celebrated work expressly on the ancient papyrus, by way of commentary on three chapters of Pliny, in which is amply, and with great learning, explained all that relates to this subject; yet Scaliger has written a severe critique on it, in which some inaccuracies of Guilandinus are pointed out; but this has not hindered Kirchmayer from adopting almost Guilandinus's whole book in his dissertation on the papyrus. Add, that the most ingenious and learned count Scipio Maffei has lately vindicated Guilandinus against the exceptions of Scaliger, as well as of Vossius and Hardouin. (Vide Ist. Diplomat. lib. ii. Bibl. Ital. tom. ii. p. 248. Melch. Guilandini Papyrus, h. e. Commentarius in tria C. Plinii Majoris de Papyro capita, fc. lib. xiii. cap. 11, 12, 13, first published at Venice in 1572, and afterwards

at Amberg, in 1613, by Salmuth.) It seems, Guilandinus intended a commentary on the whole of Pliny's Natural History; but this small part, not exceeding a moderate page, taking him up full six months, it is no wonder he was discouraged from proceeding with the rest. In these three chapters he has restored about twenty passages in the text of Pliny, not merely from his own conjecture, or the help of MSS. but from the nature of the things described, and the testimonies of authors of the first rank: besides that, he had been upon the spot, where formerly the papyrus was manufactured, and had carefully examined all the ancient Greek and Latin authors who speak of it.

Jos. Just. Scaligeri Animadversiones in Melchioris Guilandini Commentarium in tria C. Plinii capita, lib. xiii. Historiæ Mundi sive Naturalis, quibus agit de Papyro, first published in the Lectiones Bibliothecariæ Memorabiles, of Rudolphus Capellus, at Hamburg, in 1682, where he follows Guilandinus step by step, finds as many faults in him as his father had done in Cardan, and uses him altogether as coarsely; every where pointing out his literary mistakes, and labouring to shew, that instead of restoring Pliny, he has often mistaken and corrupted him. M. Seb. Kirchmaieri Uffenhaimensis Franci Dissertatio Philologica de Papyro veterum, Wittebergæ 1666, 4to.

He had done better service, if, besides Guilandinus, he had consulted others, and particularly Scaliger. But as he chose to follow one rather than many, and that too as the blind follow their guides, his fate has been much the same.

The origin of the art of making paper of the papyrus is very obscure; no doubt it was first discovered in Egypt. Isidore fixes it more particularly to the city Memphis, Orig. lib. vi. cap. 10. in which he seems to be countenanced by Lucan, where he says,

“ Nondum fluminea Memphis contexere biblos
Noverat———” Pharfal. lib. iii. v. 222.

The era of this invention is warmly disputed: Varro, the most learned of the Romans, fixed it to the time of Alexander the Great, after the building of the city of Alexandria by that conqueror; but several objections, of no small weight, are brought against this decision. Pliny recites a passage out of a very ancient annalist, one Cassius Hemina, wherein mention is made of paper books found in Numa's tomb, five hundred and thirty-five years after his death, which had been buried with him: now Numa was prior to Alexander by above three hundred years. Guilandinus, in effect, maintains, with great erudition, that the name and use of the papyrus were known to the Greeks long before Alexander conquered Egypt; and that the words βιβλος, and βιβλίον occur in their received signification in authors prior to, or at least older than, Alexander: particularly Anacreon, Alcæus, Plato the comedian, Aristomenes, Carinus, Antiphanes, Plato the philosopher, Æschylus, and Aristotle. And whereas some speak of a kind of unknown pseudo-biblos, in use before the discovery of the true sort, he argues, on the contrary, that the biblos mentioned by those authors, prior to the conquest of Alexander, appears from Herodotus, Theophrastus, and others, to be the very same plant with the biblus, or papyrus, of which paper was afterwards made: even Homer and Hesiod, the most ancient Greek poets, and who by Herodotus's testimony lived about four hundred years before himself, appear to have been no strangers to the papyrus, since they both make express mention of it. Vide Plin. lib. xiii. cap. 13. Guiland. Papyr. Membr. 2. Reim. Idea Syft. Antiq. Liter. p. 285, seq. Kirchman Diff. de Papyr. art. 11. sect. 2.

To this it may be answered, that supposing the plant papyrus known in Greece long before Alexander's conquest of Egypt; it no more follows, that they had then the use of paper; than it follows, that men had wine immediately on the discovery of the vine.

In reality, Guilandinus produces testimonies, from Anacreon and Alcæus, in which the papyrus is employed for binding, and not for paper; add, that he ill translates τὸ ἑλεγχνιον, *ellyphnium*; since λυχνιον here is the torch itself. Nor does the poet say it was made of papyrus, but tied up with it. Vide Scalig. lib. cit. Reimm. ubi supra, p. 305. seq.

Some have even doubted whether the art of manufacturing the papyrus was so ancient as Alexander's time; chiefly on this ground, that, for two hundred years after Alexander, men wrote on skins, and on the barks of trees: but this is nowise conclusive. The scarcity of the new manufacture may account for it: for some ages afterwards, even as low as Tiberius, we read of such a scarcity of paper, that its use, even in contracts, was dispensed with by a decree of the senate, and the opinion of the judges. The same consideration may be carried farther: paper might have been known in Egypt, Judæa, Syria, and Asia on this side Taurus, long before the birth of Alexander, though not in common use; but it might be later before the Europeans received it; and probably it was by means of Alexander's conquest that it first became publicly known there.

When the manufacture of the Egyptian paper ceased, is another question; for, at present, the *papyrotechnia Ægyptiaca* may be reckoned among those arts that are lost. Euthatius, the learned commentator on Homer, testifies, that even in his time, viz. in 1170, it was disused: Mabillon, indeed, maintains, that it continued till the eleventh century after Christ; and cites one Fridegod, a monkish poet of the tenth century, as speaking of it as subsisting in the age before his, that is in the ninth; and that it continued longer, the same Mabillon endeavours to evince, from several papal bulls wrote on it as low as the eleventh century. Vide Euthat. ad Homer. Odyss. c. Voss. de Art. Gram. lib. i. c. 37. Vide Mabill. De Re Diplom. lib. i. cap. viii. sect. 6. seq. Reim. Idea Syst. Antiq. Liter. p. 311.

Maffei, on the other hand, maintains, with more probability, that the papyrus was generally disused before the fifth century; for that we find no authentic records, written on it, dated since that time; those bulls of popes, cited by Mabillon, appearing rather to be written on cotton paper. But this, we may observe, relates only to the general and legal use of the papyrus. For that it should have continued to be made by particular persons several hundred years after it first began to give way, is not to be wondered at. Vide Maffei Ist. Diplom. loc. cit. Bibl. Ital. tom. ii. p. 251.

In reality, a more commodious sort of paper, made of cotton, having been invented some ages before in the East, and coming to be introduced into Europe, seems to have brought the papyrus into disuse. To which the continual wars with the Saracens, by which the traffic to Alexandria was rendered precarious, might possibly not a little contribute.

Yet several books, written on leaves of the papyrus, have even continued to our days: Mabillon says, he had one of them; and adds, that there was another in the Petavian library, being a volume in small folio, containing several sermons of St. Augustine; he also mentions a third, containing that father's epistles, formerly belonging to the church of Narbonne, and afterwards in the custody of madame De Phirmacon; besides the homilies of Avitus, bishop of

Vienne, and divers diplomas or charters, all written on the papyrus, which appear not to be less than eleven hundred years old. But the decisions of this learned father concerning MSS., notwithstanding all his diplomatic skill so highly boasted of, are not always infallible; witness his taking the MS. of St. Mark's Gospel, at Venice, to be written on the Egyptian papyrus; and that of Josephus, at Milan, not to be so. Maffei shews, on the contrary, that the former is cotton paper; and that the latter appears, at first sight, to be Egyptian; not but the Venetian MS. is very old; but it has been so much used, that its leaves are, as it were, transformed into the original paste from whence they are made. Vide Mabill. Suppl. ad Libr. de Re Diplom. Journ. des Sçav. tom. xxxii. p. ii. p. 992. Maffei, lib. cit. Bibl. tom. ii. p. 252. And Montfaucon. Paleog. Græc. p. 14.

PAPER, *Manner of making the Egyptian.* They began with lopping off the two extremes of the papyrus, viz. the head and root, as of no use in this manufacture; the remaining stem they slit lengthwise into two equal parts, and from each of these they stripped the thin scaly coats or pellicles, of which it was composed, with the point of a pen-knife. The innermost of those pellicles were looked on as the best, and those nearest the rind or bark the worst; they were kept apart accordingly, and constituted different sorts of paper.

These pellicles are called, in Pliny, by twelve different names; viz. *philura, ramentum, scheda, cutis, plagula, corium, tania, subtegmen, statumen, pagina, tabula, and papyrus.*

The generality of critics, in lieu of a pen-knife, employ a needle to separate the pellicles; in which they are warranted by the common text of Pliny, "Præparantur ex eo chartæ, diviso acu in præstenues, sed quam latissimas philuras." But Guilandinus makes a correction here: he had found, by experiment, that the pellicles of papyrus cannot be separated by a needle; but that a very sharp knife is required; for which reason, instead of *diviso acu*, he reads *diviso scapo*. In which he is followed by Maffei, though Hardouin, Vossius, Pitiscus, and others, retain the ancient reading. Vide Guiland. Papyr. Memb. 10. sect. 3. and 5. Maffei Ist. Diplom. ap. Bibl. Ital. tom. ii. p. 247, seq. Voss. De Art. Grammat. lib. i. cap. 37. Pitisc. L. Ant. tom. i. p. 413. vcc. Charta. Hardou. ad Plin. lib. xiii. cap. 12.

As the pellicles were taken off, they extended them on a table; then two or more of them were laid over each other transversely, so as that their fibres made right angles: in this state they were glued together by the muddy waters of the Nile. These, being afterwards pressed to get out the water, then dried and lastly flattened and smoothed by beating them with a mallet, constituted paper: which they sometimes polished farther by rubbing it with an hemisphere of glass or the like.

In other countries where the waters of the Nile were not to be had, the pellicles were fastened together with a paste made of the finest wheat-flour, mixed with hot water, and a sprinkling of vinegar.

The ingenious and learned count de Caylus, in his account of the papyrus, informs us, that the intermediate part of the stalk was cut and separated into different laminæ, which were set apart, and dried in the sun for the manufacture. These laminæ were joined together horizontally or transversely, in sheets or leaves, upon a smooth board: then moistened with water, which dissolved a kind of viscous glue in the pores of the plant, serving to cement and render the whole uniform. The sheet, being thus formed, was put into a press, and afterwards dried for use. Such,

he says, was the process of making paper in Egypt; but as the sheets were coarse, brown, unequal, and imperfect, the Romans invented methods to bring the fabric to perfection. They contrived a glue or gum, by means of which they could occasionally enlarge the size and volume. They bleached it to a surprising degree of whiteness; they beat it with hammers, so as to render it more thin and less porous; they smoothed and polished it with ivory; and by a sort of calender gave it a shining gloss, like that of the Chinese paper. According to the different degrees of delicacy, whiteness, and size, it acquired different appellations either from the names of particular manufactures, from the great personages who used it, or from the particular uses to which it was applied; such as the Fannian, the Livian, the Claudian, the Imperial, the Hieratic and the Amphitheatric.

There were paper manufactures in divers cities of Egypt; but the greatest and most celebrated was that at Alexandria, where, according to Varro's account, paper was first made. It is certain at least it was from hence that Greece and Italy was furnished, on account of the convenient situation of that port; and it is more than probable it was this that gave the Romans occasion to conclude the art had been invented there. It was not till late, when Egypt was reduced into a Roman province, that they had much intercourse, or even knowledge of the inland cities of Egypt, where paper was also made. The trade and consumption of this commodity were in reality incredible. Vopiscus relates, that the tyrant Firmus, who rebelled in Egypt, publicly declared he would maintain an army only with paper and glue, "papyro & glutine." This, Casaubon understands as spoken of the produce and revenue of paper; though Salmastius takes it to be meant of the papyrus itself, which could supply most of the necessaries of life. Vide Montfauc. Palæogr. Græc. lib. i. cap. 2. p. 14.

We find divers species of Egyptian paper mentioned in ancient writers: some denominated from the places where they were manufactured; as 1. The *Amphitheatrica*, supposed to have been made in some building belonging to an amphitheatre at Alexandria; though Guilandinus, with more probability, reads it *Arthribitica*, from Arthribus, a city in the middle of the Delta, which was the place of its manufacture. What countenances this correction, is, that we find mention of this paper before there was so much as an amphitheatre at Rome, much less at Alexandria. 2. *Saitica*, made in the city Sais. 3. *Taniotica*, or, according to others, *Taitica*, whose place authors are not agreed on. There were also other sorts denominated from the makers; as 1. The *Fanniana*, from the grammarian Rhem. Fannius Palæmon, who kept a paper work. This kind was small, but finer than the Amphitheatric paper; being first wrought at Alexandria, and afterwards finished at Rome. 2. *Claudia*, first made by order of the emperor Claudius. This was reputed the best of all, in that, besides the two pellicles, in common with the rest, it had a third. Others were denominated from the uses they were intended for; as, 1. *Hieratica*, the first or oldest sort, which was appropriated to religious uses; this was afterwards denominated *Augusta* and *Liviana*, in compliment to the emperor of that name, and his wife; who, according to some, improved and made it whiter than before. 2. *Emporetica*, or *Emporica*, a small and coarse sort, serving for shopkeepers uses, to tie up goods, &c. The qualities for which the ancient papers were prized, were their thinness, closeness, whiteness, and smoothness; though their breadth also considerably enhanced their value. That sort called *charta Claudia* was thirteen inches wide; the *Hieratica*, eleven; the *Fanniana*,

ten; and the *Amphitheatrica*, nine; as to the *Saitica*, it exceeded not the diameter of the mallet it was beaten with.

See farther concerning the ancient paper, in Nigrifoli Diff. de Charta, ejusque Ufu apud Antiquos. Ext. in Galer. de Minerv. tom. iii. p. 249, seq. Other authors are enumerated in Fabric. Bibl. Antiq. cap. xxi. sect. 9. p. 609. Pitfc. L. Ant. loc. cit.

PAPER, *Bark*, if it may be so called, was only the *liber*, or inner whitish rind enclosed between the outer bark and the wood of divers trees, as the maple, plane, beech, and elm, but especially the *tilia*, Φιλύρα, or *linden-tree*, which was that mostly used for this purpose. On this, stripped off, flatted, and dried, the ancients wrote books; several of which are said to be still extant. Vide Plin. Hist. Nat. lib. xiii. cap. 11. Hardou. Not. ad eund. Suid. Lex. in voc. Φιλύρα. Ifid. Orig. lib. vi. cap. 13. Alexand. ab. Alexand. lib. ii. cap. 30. Salmuth. ad Pancirol. lib. ii. tit. 13. p. 252, seq.

Mabillon and Montfaucou speak frequently of manuscripts and diplomas on bark, and are very express in distinguishing between the papyrus used by the Egyptians, and the liber or bark in use in other countries. The two are alleged to differ in this, that the bark paper was thicker and more brittle than the papyrus, as well as more apt to cleave or shiver, by which the writing was sometimes lost; as is the case in a bark manuscript in the abbey of St. Germain's, where the bottom of the paper remains, but the outer surface, on which the letters had been drawn, is in many places peeled off. Vide Montfauc. Palæogr. Gr. lib. i. cap. 2. p. 15. Mabill. de Re Diplom. lib. i. cap. 8. Reimm. Idea Syst. Antiq. Liter. p. 311.

But Maffei, it must not be forgot, combats the whole system of bark manuscripts and charters as a popular error; and maintains, that the ancients never wrote diplomas on bark; that the distinction between the papers made of papyrus and of cortex, is without foundation; that the only use of the *tilia*, or *linden*, was for making thin boards or tablets for diptycha or pocket-books, wherein they wrote on both sides, as is done among us: an advantage which they could not have in the Egyptian paper, by reason of its thinness.

A late French writer on the rules of criticism wanders still farther out of the way, when he speaks of a sort of paper, in Egypt, made of the pith of the cyprus: he describes the manner of preparation, which was by reducing this pith to a pulp, and then spreading it out in leaves. Vide Hon. St. Marie Reflex. sur les Regl. de la Crit. tom. ii. diff. 77. This we suspect for a chimera hatched only in the critic's brain.

Not but there occur divers anomalous sorts of paper, which antiquaries are not a little puzzled what species to refer them to; such is that of two bulls in the archives of the church of Gironne, issued by the anti-popes Romanus and Formosus, between the years 891 and 895. They are two ells long and one broad; and consist of two leaves or pellicles glued together transversely, and are still legible in most places. The conjectures of the French literati, in regard to these, are numerous; the abbot Hiraut de Belmont has a discourse express on the occasion. Some will have them made of the leaves of the *alga*, or sea-wreck; others of the leaves of a rush, called *la boga*, growing in the marshes of Rouffillon; others of papyrus; others of cotton; and others of bark. So little certainty does there really appear to be in these things, on which the critics nevertheless often lay a great stress. Vide Mem. de Trev. Sept. 1711. p. 1559, seq.

PAPER, *Cotton*, *charta bombycina*, Βομβυκινη (thus called from

from *βομβυξ*, a word which anciently signified *flax*, though in after-times *βομβυξ* and *βαμβυξ* came to denote *cotton*), is a sort of paper which has been in use upwards of seven hundred years ago, as is shewn by Montfaucon from several authorities; what is more, cotton paper appears to have been very common at the beginning of that time, and consequently must have been invented long before, probably about the clofe of the ninth, or the beginning of the tenth century.

In the French king's library are MSS. on this paper, which, by the character, and other circumstances, appear to be of the tenth century. Be this as it will, from the twelfth century, cotton MSS. were more frequent than parchement ones. Vide Montfaucon. Palægr. Græc. lib. i. cap. 2. p. 17, seq. item, lib. iv. cap. 6. p. 209. Maffei, lib. cit. Bibl. Ital. tom. ii. p. 252.

PAPER, *Incombustible*, is made of the lapis asbestos, or *linum vivum*, which will bear burning without being injured.

Dr. Bruckman, professor at Brunswick, has published a natural history of the asbestine, or incombustible paper; and, what is most remarkable, has printed four copies of his book on this paper: they are deposited in the library of Wolfenbützel. Vide Bibl. Germ. tom. xiv. p. 190.

The manner of making this extraordinary paper is described by Mr. Lloyd, from an essay made by himself. He pounded a quantity of the asbestos in a stone mortar, till it became a downy substance; then sifted it in a fine searce, and by this means purged it indifferently well from its terrene parts; because the earth or stones he could not pick out of it before, or at the pounding, being reduced to a powder, came through the searce, the *linum* remaining. This done, he brought it to the paper-mill; and putting it in water, in a vessel just big enough to make a sheet with such a quantity, he stirred it pretty much, and desired the workmen to proceed with it in the usual method, with their writing-paper mould; only to stir it about always before they put their mould in; considering it as a far more ponderous substance than what they used; and that consequently, if not immediately taken up after it was agitated, it would subside.

The paper made of it proved but coarse, and was very apt to tear; but this being the first trial, there is reason to believe it might be much improved; nor did the workmen doubt, but in case it were pounded in one of their mortars, for twenty hours space, it would make good writing-paper. Vide Phil. Transf. N^o 166. p. 824. See ASBESTOS.

PAPER, *Linen or European*, is chiefly made of linen rags beaten to a pulp with great hammers, and the foil carried off by a continual supply of fresh water, conveyed among the pulp in little troughs, till it be rendered perfectly white.

Besides the chief use of this paper, which is for writing and printing, there is a great consumption of it in packing up goods, and on other occasions.

The manufacture of paper has got footing in most countries; though France, Holland, and Genoa, are the places where it has succeeded best. In the general it depends much on the quality of the linen worn in the country where it is made; where that is coarse and brown, &c. the rags, and consequently the paper made of them, must be so too. Hence the whiteness of the Dutch and Flemish papers, beyond the Italian and French, and much more the German papers. The English manufacture was a long while in no great reputation; but it is every day improving; inasmuch that we now import little of the ordinary sorts, which were formerly all brought from abroad. Yet paper-mills are of some standing among us. We find one erected at Dartford

as early as the year 1588, which we believe was the first, and which is celebrated by a noted poet of that age, Tho. Churchyard, in a work in verse, intitled "A Description and Discourse of Paper, and the Benefits it brings; with the setting forth of a Paper-mill, built near Dartford, by a High-German, called Mr. Spilman, Jeweller to the Queen, Lond. 1588. 4to."

In reality, the deficiency of the English paper manufacture did not seem owing so much to the quality of our rags, as to the want of skill and attention in the makers; but the manufacture of paper has been very considerably encouraged in our country, and has already arrived to a great degree of perfection.

Anderson, in his Hist. of Com. vol. ii. p. 197. says, that till about the year 1690, there was scarcely any other kind of paper made in England, but the coarse brown sort. But the war with France occasioning high duties on foreign paper, the French Protestant refugees settled in England chiefly, and also our own paper-makers now began to make white writing and printing paper, which, he adds, in length of time, has been brought to so great perfection, both for beauty and substance, that in our own time we import only certain kinds of Genoa and Dutch paper, which bears but a very small proportion to all the paper used in the British dominions. This has produced, it is said, a saving to Britain of 100,000*l.* which was paid annually to France for paper only.

Another writer says, that the English manufactures now provide above seven-eighths of the whole quantity of paper consumed in Great Britain.

When and by whom linen paper was invented is a secret, which Polydore Virgil owns he could never trace. Scaliger will have it to have been found out by the Germans. Maffei affirms it certain, that the invention is owing to the Italians. Others ascribe it to some refugee Greeks at Basil, who took the hint from the manner of making cotton paper in their own country. Conringius takes the Arabs to have first brought it among us. Perhaps the Chinese have the best title to the invention; who for many ages have made paper much after the same manner; and even, in some provinces, of the same materials, *viz.* hemp, &c. Vide Polyd. Virg. de Inventor. Rer. lib. ii. cap. 8. Secund. Scaliger. p. 7. Fabric. Bibl. Antiq. cap. 9. lect. 21. Hitor. Diplom. lib. ii. Bibl. Ital. tom. ii. p. 253. Phil. Transf. N^o 288. p. 1515. Conring. Epist. ap. Act. Erud. Lips. an. 1720. p. 94. Savaar. D. Comm. tom. ii. p. 963. Du Hald. Descr. Chin. tom. i. p. 363.

Linen paper appears to have been first introduced among us towards the beginning of the fourteenth century.—The learned Conringius denies, that there are many manuscripts of this paper above four hundred years old; with whom agrees the count Maffei, who finds no marks of its use before the year 1300. Vide Conring. Epist. ap. Act. Erud. Lips. an. 1720. p. 94. Maffei Hitor. Diplom. lib. ii. Bibl. Ital. tom. ii. p. 253.

Some indeed go much farther back; and take the *libri lintei*, mentioned by Livy, and other Roman writers, to have been written on linen paper; but Guilandinus, and after him Allatus, and others, have sufficiently refuted this notion; and shewn, that the *libri lintei* were written on actual pieces of linen cloth, or canvas, prepared for this purpose, such as painters still use; and not on paper made of linen rags. Vide Liv. Dec. 1. lib. iv. Plin. Hist. Nat. lib. xiii. cap. 11. Paus. L. Ant. tom. ii. p. 85. Guiland. Papyr. Memb. 25. Salmuth. ad Pancirol. lib. ii. tit. 13. p. 253.

Others run into the contrary extreme, and make paper the invention of a very late date. The Jesuit Inchofer dates

PAPER.

its origin about three hundred years ago; with whom agrees Milius, in his "Hortus Philoſophicus," who maintains, that the art of making paper was not invented till about the year 1470. Of the ſame opinion ſeems Ray, who tells us the art of making this paper was not known in Guernſey till the year 1470, and when two perſons, named Anthony and Michael, firſt brought it to Baſil, out of Galicia in Spain. In effect, if the invention be owing to the refugees Greeks at Baſil, who fled thither after the ſacking of Conſtantinople, it muſt at leaſt be poſterior to the year 1452, when that city was taken. Some add a farther argument for the novelty of paper, drawn from the novelty of hempen cloth, which Rabelais, who died in 1553, mentions as firſt found out about a hundred years before him; and which was ſo ſcarce in the time of Charles VII. of France, who died in 1461, that the queen, his wife, was the only woman in France that had a couple of ſhifts of it. Vide Mabill. de Re Diplom. lib. i. cap. 8. Reimm. Idea Syll. Antiq. Liter. p. 313, ſeq. Balbin. Miſcell. Hiſt. Bohem. cap. 22. Aët. Erud. Lipſ. 1682. p. 243. Ray Hiſt. Plant. lib. xxii. Phil. Tranſ. N^o 288. p. 1515. Naudæan. p. 82. Nouv. Rep. Let. tom. xxvi. p. 571.

But theſe ſuggeſtions are refuted by Mabillon, from the teſtimonies of writers prior to the time here ſpoken of, and from many manuſcripts of about four hundred years old, which are written on linen-paper. The Jeſuit Balbinus produces divers inſtances of paper manuſcripts, written before the year 1340. An ingenious writer of our own country affures us, he had a piece of paper which agreed well with the charter dated in 1358, in the thirty-ſecond year of Edward III. He adds, that in the archives of the library belonging to the dean and chapter of Canterbury, is an inventory of the goods of Henry, prior of Chriſt-church, who died in 1340, written on paper; and that in the Cotton Library there are ſeveral writings on our paper, in the times of moſt of our kings and queens, as high as the fifteenth of Edw. III. which coincides with the year 1335. And Dr. Prideaux affures us he has ſeen a regiſtration of ſome acts of John Cranden, prior of Ely, made on paper, which bears date in the fourteenth year of king Edward II. that is, anno Domini, 1320. Mabill. loc. cit. Balbin. lib. cit. Phil. Tranſ. N^o 288. p. 1515. Prid. Connect. p. 1. l. 7. p. 710.

Add, that the invention of paper may appear more modern than it is, becauſe records were not uſed to be written on it, but it was a conſiderable time confined to letters, and other fugacious compositions; which is ſo true, that, to this day, few inſtruments of any conſequence are written on it, though it have been ſo long in uſe. It is even alleged, that Peter, the venerable abbot of Cluny, who died in 1157, has a paſſage in his book againſt the Jews, which plainly indicates paper books to have been then known; on the authority of which Valeſius, in his notes on the panegyric of Berengarius Auguſtus, ſcruples not to make paper upwards of 500 years old.

Father Hardouin affures us, he had ſeen records or diplomas on it prior to the 13th century. But this will hardly be credited. Count Maffei affures us, that in all his reſearches he could never meet with one more ancient than the year 1367. It is highly probable the learned Jeſuit miſtook a cotton manuſcript for a linen one: a miſtake eaſily made, as the chief difference between the two conſiſts in the greater thinneſs of the linen paper. But it is known we have linen papers of very different degrees of thickneſs; and the like may be ſaid of thoſe of cotton. Vide Maffei Iſtor. Diplom. lib. ii. Bibl. Ital. tom. ii. p. 253, ſeq.

The invention, according to Prideaux, ſeems to have

been brought from the Eaſt; becauſe moſt of the old manuſcripts, in Arabic, and other Oriental language, are written on this ſort of paper; ſome of which are certainly much older than any of the dates above-mentioned. This author thinks it moſt probable, that the Saracens of Spain firſt brought it out of the Eaſt into that country; from whence it was propagated through the reſt of Europe.

PAPER-Making. Nature preſents us, as we have already obſerved, with a variety of ſubſtances from which paper may be made, as linen or hempen rags, the ſtalks of nettles, ſtraw, hay, and the down of thiftles. It may be alſo made of cotton, or white woollen rags, though ſuch paper would not ſerve for writing, becauſe of its hairineſs. Of all theſe ſubſtances, linen or hempen rags alone are employed by the manufacturers, except a ſmall quantity of cotton rags, which are ſometimes mixed with the linen for inferior purpoſes.

The chief proceſs of making paper conſiſts in ſeparating the fibres of the rags, by grinding, into exceedingly fine and ſhort filaments; which being mixed with water, till they make a fine pulp, may be taken up in a very thin and even layer upon a mould of wire cloth. Now by the draining away of the water through the wire, the filaments are left, interwoven or felted ſo completely among each other, that they will not ſeparate without breaking, and when dry will make a ſheet of paper; the ſtrength and quality of which depend very much upon the materials it is made from, and the equality of length and ſize to which the filaments are reduced by the grinding, which equality alone can cauſe them to float equally in the water of the pulp, and thus diſtribute themſelves fairly and equally over the wire mould when taken up by it. For writing paper, a fine white colour is neceſſary, and this is obtained either by uſing the whiteſt rags by themſelves, or by a chemical proceſs of bleaching.

The incalculable advantages which the moderns have derived from the art of printing, would have been only imperfectly known, but for the invention of linen rag paper. A more plentiful and economical ſubſtance could not be conceived than the tattered remnants of our cloths, linen worn out, and otherwiſe incapable of being applied to the leaſt uſe, and of which the quantity every day increaſes: nor could a more ready operation be imagined, than a few hours tritulation in a mill. It has been obſerved by a French writer, that the diſpatch of the proceſſes of paper making is ſo great, that five workmen in a mill may furniſh ſufficient paper for the continual labour of 3000 tranſcribers.

The art of printing would have been comparatively of little importance, without having the means of procuring a proper material to receive the impreſſions. Whiſt the Egyptian papyrus was the only kind of paper, it would have been impoſſible to have procured it in ſufficient quantities to have made large editions of books. The cotton paper, though in a progreſſive ſtage of improvement, was but a rude and perſhable article, unfit for any of the nice purpoſes to which paper is now applied.

The perfection of the art of paper-making depended upon finding a material which could be procured in ſufficient quantities, and which would be eaſy of preparation. Such is the paper now in uſe, of which we ſhall endeavour to deſcribe the manufacture.

The operation of paper making admits of three diviſions, viz. the preparation of the rags, the forming of the ſheets, and the finiſhing of the paper. The ſucceſſion of the ſeveral proceſſes is as follows: 1. The rags are waſhed, or duſted, if they are dirty; then ſorted into many qualities proper for different purpoſes. 2. The rags are bleached, to render them white; but this operation is ſometimes deferred to the next ſtage of the proceſs. 3. The waſhing engine of the paper mill

PAPER.

mill is employed to grind the rags, in water, till they are reduced to a coarse or imperfect pulp, called *half stuff*, or *first stuff*, in which state the bleaching is sometimes performed; or at other times it is bleached in the washing engine during the grinding. 4. The *half stuff* is again ground in the beating engine, and water added in sufficient quantity to make a fine pulp, which being conveyed to the vat, the preparation of the rags is completed, and the pulp or stuff is ready for making the sheets. 5. This is done by a workman who takes up a quantity of pulp upon a mould of fine wire cloth, through which the water drains away, and the pulp coagulates into a sheet of paper. 6. Another workman takes the sheet of paper off from the wire mould, and receives it upon a felt; he then covers it over with a second felt, evenly spread out; and continues this operation, which is called *couching*, till he has made a pile of sheets called a *post*, containing six quires. 7. The post of paper, with the felts, is placed in the *vat-press*, and the whole is subjected to a strong pressure, to press out the superfluous water, and give the paper a solidity and firmness it would not otherwise have. 8. The pile of paper is removed from the *vat-press*, the felts taken out from between the sheets, and they are pressed again by themselves, for a certain time, in a screw press. 9. The sheets are taken from the press, and hung up, five or six together, on lines in the drying loft, till dry. The paper is now made, and only requires to be finished; but it should be observed, that the greater number of the processes of finishing are only performed upon fine writing paper, common printing paper being ready for packing up when dried. 10. The paper, in five or six sheets together, is dipped into a tub of fine size, and afterwards pressed to force out the superfluity; it is then dried again in the drying loft: but in printing papers this process is rendered unnecessary, by sizing the stuff whilst in the engine, and adding certain ingredients. 11. An examination of each individual sheet of the paper is made, all knots and burrs are removed, and the bad sheets taken out. 12. A very large pile of paper is made, and pressed with a most immense force, to render the sheets flat and smooth. 13. The pile is taken down, sheet by sheet, and another made, without turning the sheets over: by this means new surfaces of the sheets are brought in contact with each other, and the pile being again subjected to the press, the surface of the paper is improved. This operation is called *parting*, and is repeated two or three times for the best papers. The paper is now counted into quires, folded and packed up into reams for market.

The strength and tenacity of paper depend upon the staple or fibre of the materials from which it is made. Rags of new cloth, and cordage, compose a tougher and stronger paper than old rags, which make a soft and pliable paper. The first of these materials presents a great variety, on account of the quality of the hemp or flax of which it is fabricated. Rags of fine new cloth, whether raw or bleached, stand in the first rank, after which old rags, cordage, &c. may be classed.

The sorting of the rags is of no small importance in the art of making paper; for unless the rags, which are ground at the same time in the engine, are all of the same quality, both as to substance and condition, the finest and best parts will be ground away in the mill, and carried off by the water before the coarser are sufficiently reduced to make a fine pulp. For this reason, in the sorting of the rags which are intended to make fine paper, the hems and seams should be kept apart, and the coarseness of the cloth should be considered. That cloth which is made of tow, should be separated from that which is made from the longer fibres; cloth of hemp from cloth of flax; and lastly, the degree of wearing in the

cloth should be attended to. For if rags, almost new, are mixed with those which are much worn, the one will not be completely reduced to a pulp, whilst the other will be so attenuated as to be carried off by the water, and pass through the hair strainers of the engine; hence there must be a considerable waste in the operation, a real loss to the manufacturer, and even to the beauty of the paper; for the particles first carried off by the current of the water, are perhaps those which give it that smooth velvet softness which is so great a recommendation. When the sorting is imperfectly performed, the pulp or stuff is found to have cloudy parts floating in it, owing to some masses being less reduced than others. This produces those cloudy papers wherein are seen by intervals parts more or less clear, and more or less weak, occasioned by flakes assembled on the wire of the mould, which are not sufficiently tempered and diluted to incorporate with more fluid parts.

But as it is necessary, in many cases, to mix the different qualities of rags together, to produce various kinds of paper, this should be done by reducing the different sorts of rags separately in the mill, as also the hems and threads of the stitching, because the sewing thread, being never so much worn as that of the cloth, and not so easy to be reduced, forms filaments in the paper. When the rags, unequally disposed for trituration, have been ground apart, the different pulps may be mixed together without inconvenience, and will be found homogeneous or alike, each having been ground during the time that was necessary for the state of the rag.

Without this precaution the finest particles will be always lost, and of course the beautiful quality of the paper will be altered by the coarsest. Therefore this care in sorting the rags produces a great beauty of the paper, without hurting its goodness. It will, besides, be attended with the advantage of mixing a pulp, which will form the strength of the paper, with another which will give it softness and lustre; and thus two qualities may be united which otherwise existed separately.

There are people in London, who, by dealing very extensively in rags, have it in their power to observe these precautions in sorting, and to sell separately all the different qualities to the paper makers. The same may be said of those great manufacturers who have the perfections of their work at heart. As to small country mills, it is scarcely possible for them to make so great a choice. They are often obliged to lay up for fine many rags which are properly middling, and their middling may with better reason be reserved for making the coarser sort of paper.

The people who go about the streets to buy up rags and old garments, sell them to the great dealers, who for the London market employ women to sort them into five sorts, which are denominated Nos. 1, 2, 3, 4, and 5, according to their respective qualities. No. 1 being superfine, and wholly linen, is used for the finest writing papers. The other sorts have different degrees of fineness down to No. 5, which is completely canvas, but is proper for making inferior printing papers, when it has been bleached to a good colour. There is also rag bagging, which is the materials of the strong canvas sacks the rags are sewed up in for carriage; and coloured rags, which consist of cotton, and are of all colours promiscuously mixed; but the blue are generally sorted out, for the purpose of making blue paper. The rag bagging and cotton rags are only fit for common papers. The rags are first put into a machine, called a *duster*, made in the form of a cylinder, four feet in diameter and five feet in length. It is all through covered with a wire net, and put in motion on pivots at its ends by a connection with some part

PAPER.

part of the machinery. The whole is inclosed in a tight close box to keep in the dust. A convenient quantity of rags, before the sorting, is inclosed in the cylinder of the duster, and the rapidity of its motion separates the dust from them, and it passes through the wires into the box. It is of considerable advantage to use the duster before sorting, as it makes that operation less pernicious to the people.

The sorting is performed by women and children, who are seated on benches, in a large room full of old linen, before a chest or box, which is divided into six cases, to receive as many different sorts of rags. Each woman has a piece of pasteboard, hung from her girdle, and extended on her knees, upon which, with a long sharp knife, she unrips seams and stitches, and scrapes off all filth.

Whatever can be used, after being well examined, is distributed into one of the six cases, according to the degree of fineness, and the women throw the rest at their feet. The six cases are for the six different sorts of rags: the superfine; the fine; and stitches of the fine; the middling; the seams, and stitches of the middling; and the coarse; without including the very coarse parts, which are totally rejected, at least for the making of white paper, but may serve for white-brown paper; but even for this purpose they should be mixed up with a large parcel of coarse linen. Old paper may also serve for the same use, but the waste is considerable; it is therefore reserved for pasteboard, in the manufacture of which, the stuff being worked less time in the engine, and with less force, though with the same water, it will lose much less than if worked sufficiently to make paper. Besides, paper that has been once sized still gives the pulp a viscidty, which ought to be guarded against, as it prevents the fibres floating so completely detached in the water as is necessary to make them distribute themselves sufficiently equal and regular upon the wire mould, to make a true and even sheet of paper.

Paper intended for bills of exchange, or other commercial and legal instruments, ought to be tough, in order that it may not be easily torn, when made as thin as it is necessary to be, for the ease of conveyance by post. For this, paper materials of the best quality must be entirely, or in large proportion, employed; and the price which the consumers are disposed to pay for the article is sufficient to allow the best materials, and still indemnify the manufacturer for his care and industry.

Common papers also require to be more or less tough, according to their thickness, and the use to which they are applied; but a clear white colour is sought in paper of every description, whether for writing or printing. The manufacturers of paper were formerly obliged to attend to the colour of the rags in the sorting, as well as to their qualities; but of this care they are now in a great measure relieved, by the introduction of bleaching, which enables them to produce the finest paper, in point of colour, from any kind of rags. They have only therefore to find such materials as will make paper of a strong texture, and a fine even surface, knowing they can produce colour at pleasure. To bleach the rags by the oxymuriatic acid gas, they are first washed in hot water, by a fulling mill, such as is used for scouring cloth: this removes the dirt, and they are put into a receiver or chamber, made of wood, in a cubical form, and the joints air tight. It is provided with several stone retorts, which being filled with a mixture of manganese, with two-thirds its quantity of sea-salt, and a quantity of sulphuric acid equal to the salt, will, when moderately heated by a small sand-bath furnace, throw into the receiver a gas which quickly discharges any colour the rags may contain. This process, which is very similar to that used for bleaching

cotton thread, was invented by Mr. Campbell, who had a patent for it in 1792. In his specification, he directs that the rags should, before they are put into the receiver to be bleached, contain about their own weight of fair water, the super-abundant water being pressed out. The rags should first be opened by a machine, called by the cotton manufacturers a *devil*. or some machine, of that nature, and they are to be distributed in the receivers, in layers spread on frames, so that they will not come in contact with each other, or they may be placed in the body of the receiver, and have stirrers or agitators, provided to expose every part of them to the action of the bleaching gas.

After the process, which must be concluded as soon as ever the rags are sufficiently bleached, lest the gas should act upon and injure their quality, they are to be washed in water, and will be ready for the mill. Some manufacturers think that this mode of bleaching the rags makes them rotten, and injures the quality of the paper, which it certainly does if carried too far, though there is no doubt of the advantages of the process if well conducted.

The bleaching process has given rise to great complaints from the printers, as many printing papers are now made from cotton rags. The oxygenated muriatic acid being applied for the purpose of obtaining dispatch and delicacy of colour, produces a paper of a good appearance from inferior staple. Nothing can be more perplexing to a printer, nor more detrimental to his labours, than this kind of bleached paper; for although it may be thick, and seem strong in the ream, no sooner does the water penetrate through it, than it loses its adhesive quality, and becomes so loose and soft as scarcely to bear handling, and in working under the press sinks down into the cavities of the letters, leaving a part of its substance behind, after every impression, until it so clogs the type, that the work is rendered scarcely legible. Nor is it less exceptionable in point of durability, as it must moulder away in a little time, with the common use that popular books generally undergo. Notwithstanding this it must be allowed, that if by bleaching the paper makers can produce a bad article from such materials as were otherwise of no use, they are also able to improve their manufacture when they use the same materials as formerly. It is found most advantageous to bleach the rags in the state of half stuff, that is, when they have been once worked by the mill, as the fibres being by that means separated, the gas has greater access to the interior parts, and they are bleached quicker, so as to have less danger of injury to particular parts, by too long an action of the gas. Another method of bleaching is by muriat of lime put into the washing engine, which for printing papers is the best mode of any. We shall describe it in the process of washing.

The engines now used in the paper mills are constructed on such a powerful principle, that they are capable of reducing the strongest and toughest rags to pulp in a moderate time; whereas the old machines were not able to work the rags without *fermenting* them, as a previous process. The following extracts from a French work, on the art of making paper, will shew the manner in which it was conducted 60 years ago.

“ The rags, being sorted, are put into a large stone vat, sixteen feet long, ten broad, and three deep; water is poured upon them to the top during ten days, and eight or ten times every day without stirring them. They are afterwards left to rest the same number of days, and sometimes more or less, without pouring water upon them. Then being turned over, the centre is brought to the surface, to facilitate the fermentation; and after being turned again, they are still left fifteen or twenty days in fermentation,

tation, so that the rotting may last five or six weeks; the term is not fixed, but when the heat becomes so great, that the hand, thrust in, cannot endure it above some seconds, it is judged that it is time to stop it.

"In mills, which have but few rags to work upon, they are left to rot longer, because the heaps being smaller, heat less, and with more difficulty; so that nothing can be justly determined of the time proper for the rotting part. It depends also on the quality of the rags; the finest linen does not rot so soon as the coarse; and linen that has been worn with more difficulty than new, because the internal humidity, that disposes the fibres to fermentation, is more considerable in new or coarse, than in fine or worn linen. Such as are more or less strong, more or less worn, resist the action of rotting in different degrees, some being spoiled, when others have not gone through the first fermentation: so that the rags, which have been sorted with great care, ought to be left to rot together, to avoid the risk of altering the whole parcel, by the mixture of a portion of rags quite different from the rest. When champignons grow on the heaps of rags, it is reckoned to be a sign of their being well rotted.

"Besides this, there is another method for disposing of the rags in the place for rotting and fermenting them. Having been wetted with water, a heap is made of them in a corner of the vaulted room, which is destined for that purpose. They are watered from time to time, and when sufficiently heated, are transported into another angle of the same room, so that what was at the top of the first heap, is now laid under the second, and care is taken to throw water upon them from time to time. When this heap takes heat again, it is transported to the third corner, where, having fermented again, it is carried into the fourth angle; observing always to lay those rags under the heap that were at the top of the foregoing, and to water them often, for a reddish water will come from them, which it is very necessary to clear the rags of. When the heap in the first corner is brought away, another is formed in the same corner, which passes in its turn to the several corners of the room.

"Some, to accelerate the operation of rotting and fermenting, throw lime upon the rags. Perhaps a very small quantity of lime may be used: but if too much is laid on, the corroded rags will be too soon reduced into a pulp, and will pass through the strainer with the water, which ought to carry off only their filth, and will occasion a considerable waste. The use of lime, for the purpose of rotting rags, is absolutely prohibited in France.

"Fermentation, or rotting, makes the paper even, curdled as it were, soft, and gives it weight; if stopped too soon, the paper becomes crude, hard, light, stiff, requires more time to be worked, and the fecula, or pulp, does not so easily form a coagulation on the wire of the mould. It is sometimes observed, in regard to good rags that have not rotted, that the fecula is, as it were, enveloped in a viscid substance, which prevents its uniform precipitation; and this proves that rotting helps to clear off the unctuous matter in rags. If, on the contrary, the rags were left to ferment too long, a considerable waste would be occasioned, and more matter required for the same quantity of paper, because the parts attenuated by fermentation, would be too readily carried off by the washing. And lastly, if they were left to heat too long, they would be reduced to dust, and burn into smoke and ashes."

The action of rotting was, at that period, thought necessary for abridging the labour of making paper, and facilitating the operation of the mill; but several advantages are

procured by dispensing with it, now we are able to destroy the texture of the cloth and reduce it to pulp, without previously corrupting its substance by rotting it; the paper is much stouter, is less liable to break, and is also whiter, for the fermentation gave a yellowish hue to the surface of the rags, which the mill could not take out without difficulties, and never could entirely, if the rags were too rotten.

We now come to describe the structure of paper mills. In England they now work with cylinders, or engines, an invention which was brought from Holland many years ago, and found to be so great an improvement, that it has been universally adopted. The old mills, which are still in use in some parts of the continent, actuate a number of stampers, or pestles, which pound the rags in wooden mortars till they are reduced to a pulp. These mortars are cut out in a block of heart of oak, well seasoned, the cavity being of an oval figure, about eighteen inches broad, thirty inches long, and eighteen or twenty in depth; the bottom concave, and lined with an iron plate an inch thick, eight inches broad, and thirty long, shaped inwards like a mould for a falcon, with the head and tail rounded. In the middle of the mortar is a cavity beneath the plate, and four or five grooves are cut, forming channels which lead to a hole cut from the bottom of the cavity quite through the block: it is covered by a piece of hair sieve fastened on the inside. This plate is grooved to make teeth, on which the teeth of the hammers act, to cut the rags in pieces. The use of the hair sieve is to prevent any thing from going out except the foul water. Two hammers or pestles work side by side in each mortar, and are lifted alternately by the mill: they are sometimes made in the same manner as the stampers of an oil mill, to lift perpendicularly. In other mills they are large hammers moving on a centre like a fulling mill, and lifted by cogs upon the mill shaft in the same manner. The mortars are kept constantly supplied with fair water, by little troughs, leading from a cistern, which is kept full by small buckets affixed to the floats of the water-wheel; these, when they have raised the water to the top, pour it out into the cistern, in the same manner as the Persian wheel.

This rude and imperfect machine operated very slowly, and suffered a great part of the rags to escape being reduced, whilst other parts were beaten too much. It is not now to be met with in England, the Dutch engines having taken their place, to the great improvement of the paper trade; these are turned by water mills, as they require a very great power to actuate them, though their performance is far greater, with the same power, than the mortars.

The construction of the mills is varied in different situations; but to explain the best kind, we have in *Plate I. Paper Mill*, given a drawing of one made with iron wheels, *fig. 1.* being an elevation, and *fig. 2.* a plan: the same letters of reference are used in both. The water-wheel which gives the motion cannot be seen, as it is situated beneath the floor, but its dimensions are marked by four dotted lines AAAA: in the plan it is enclosed between the three walls of the house PPR, and a fourth wall Q, which is built up across the house, to support the floors N and O, on which the engines stand: the wall R has arches in it to admit the water of the stream to the wheel, a proper gate being fixed to regulate its quantity: the axis of the water wheel, which is of cast iron, comes through the wall Q, and has a large cog-wheel E upon it, which is the full size of the water wheel, and by the paper makers is termed the *master-wheel*; the extreme end of the shaft is sustained in a bearing, which lays on a beam G G, supported on a wall of masonry. The pinion C, called the

wallower,

PAPER.

swallower, is turned by the master-wheel B, and on its axis is fixed the large spur-wheel D, called the *fly-wheel*, giving motion to the two pinions E, F, of the engines K and L: the shaft of the wheel D and pinion C are supported at one end in a frame H H I, and the other, in a bearing fixed in the wall Q. The engines K and L are placed on the floors N and O upon different levels, as shewn by *fig. 1*, the bottom of L being higher than the top of K, so that the contents of L may be let down through a plug-hole in the bottom. The upper engine L is called the *washer*, where the rags are first worked coarsely, with a stream of water running through them to wash and open their fibres; after which washing they are called *half stuff*, and are then let down into the beating engine K, to be ground, and reduced to a finished pulp, proper for moulding into sheets of paper.

By the arrangement of the wheels of the mill, the cylinders, *k* and *l*, of the two engines are contrived to make about from 120 to 150 revolutions *per* minute, when the water-wheel moves with its proper velocity; though the beating engine revolves much quicker than the washer, its pinion, F, having only 24 teeth, while the washer, F, has 28. The great wheel, B, has 196 teeth, and the pinion, C, 38 teeth; therefore it makes about $5\frac{1}{2}$ turns, for one of the water-wheel. The wheel D has likewise 196 teeth, and turns the washer, F, of 28 teeth about 36 times, for once of the water-wheel; and the beater, E, about 42 times. M is a cog-wheel, put in motion by the teeth of the great wheel B: on the extremity of its spindle is a crank *a*, which, by a connecting rod, gives a reciprocating motion to a lever *c d*, for the purpose of working two pumps, *e, f*, which raise water into a cistern *b*, drawing it from the water of the mill-dam by a suction-pipe *g*. These pumps raise up a constant stream of fair water, which is necessary to be kept running through the rags in the washing-engine, to carry away the dirt separated from them by the operation.

The engines are shewn at K and L, in the plan: each consists of a wooden vat or cistern, divided by a partition in the middle; and in one of these divisions, their cylinders, *k* and *l*, are seen. These are provided with teeth or cutters, which act against similar teeth fixed in blocks, situated beneath the cylinders, to cut the rags between them, when they revolve. The structure of an engine is more minutely explained by *figs. 1, 2, 3, 4, &c. of Plate II.*; *fig. 1* being a section through the length of the engine, and *fig. 2*, a horizontal plan. The large vat or cistern, A A, is of an oblong figure on the outside, the angles being cut off; but the inside, which is lined with lead, has straight sides and circular ends. It is divided by a partition B B, also covered with lead. The cylinder, C, is fixed fast upon the spindle D, which extends across the engine, and is put in motion, as before described, by the pinion E, placed on the extremity of it. The cylinder is made of wood, and furnished with a number of teeth, or cutters, fixed fast on its circumference, parallel to the axis, and projecting about an inch, as is shewn on a larger scale at *fig. 5*. Immediately beneath the cylinder, a block of wood, H, is placed, and provided with similar cutters to those of the cylinder, which, when they revolve, pass very near the teeth of the block, but do not touch; the distance between them being capable of regulation, by elevating or depressing the bearings on which the necks, D, D, of the spindle are supported. These bearings are made on two levers, F, F, which have tenons at their ends, fitted into upright mortises, made in short beams, G, G, bolted to the sides of the engine. (See also *fig. 3.*) The levers, F, F, are moveable at one end of each,

the other ends being fitted to rise and fall on bolts, in the beams G, as centres. The front one of these levers, or that nearest to the cylinder C, is capable of being elevated or depressed, by turning the handle of the screw *b*, which, as shewn in *fig. 3*, acts in a nut *a*, fixed to the tenon of F, and comes up through the top of the beam G, upon which the head of the screw takes its bearing. Two brasses are let into the middle of the levers, F, F, and form the bearings for the spindle of the engine to turn upon. The screw, *b*, is used to raise or lower the cylinder, and cause it to cut finer or coarser, by enlarging or diminishing the space between the cutters in the block and those of the cylinder.

Near K, *figs. 1* and *2*, is a circular breasting made of boards, and covered with sheet-lead: it is curved to fit the cylinder very truly, and leaves but very little space between the teeth and breasting. An inclined plane, K, leads regularly from the bottom of the engine-vat to the top of this breasting; and at the bottom of it the block, H, is fixed. The engine is supplied with water by a pipe, Q, bringing it from the pump: this pipe delivers it into a small cistern, M, adjoining, and communicating with the engine. The pipe has a cock, P, to stop the entrance of the water, when required, or to regulate the quantity of its discharge. The small cistern has a grating fixed across it, covered with a hair-strainer, to catch any extraneous matter, which may come in with the water; or a flannel bag is sometimes tied over the orifice of the cock P, through which all the water must be filtered. When the engine is filled with water, and a quantity of rags put in, they are, by the revolution of the cylinder, drawn between its cutters and the teeth of the block H. This cuts them in pieces; then, by the rapid motion of the cylinder, the rags and water are thrown over the top of the breasting, upon the inclined plane: in a short time, this raises more rags and water into that part of the engine-vat; and the tendency to restore the equilibrium puts the whole contents of the vat in slow motion, down the inclined plane K, and round the partition B B, by which they come to the cylinder again in about the space of 20 minutes; so that the rags are repeatedly cut and chopt in every direction, till they are reduced to a pulp.

This circulation is of advantage, in turning the rags over in the engine, and causes them to present themselves to the cutters in a different direction every time; for as the cylinder cuts or clips in straight lines, in the same manner as a pair of shears, it is requisite to cut the rags across in different directions, to reduce them to a pulp. The manner of the cutting is this: the teeth of the block are placed rather inclined to the axis of the cylinder, as shewn by *fig. 4*, but the teeth of the cylinder are parallel to its axis; therefore, the cutting edges, when they meet, are at a small angle, and come in contact first at one end, and then successively the contacts proceed along to the other end, so that any rags interspersed between them are cut in the same manner as they would be between the blades of a pair of shears. Sometimes the plates or cutters, *k*, in the block are bent to an angle in the middle, instead of being straight, and inclined to the cylinder: in this case, they are called elbow plates, and of course the two ends are both inclined to the axis of the cylinder in opposite directions. In either case, the edges of the plate of the block cannot be straight lines, but must be curved, to adapt themselves to the curve which a line traced on the cylinder will of course have. The plates or cutters of the block are united, by screwing them altogether, and fitting them into a cavity cut out in the wooden block H; their edges are bevelled away on one side only, as shewn at *k* in the section, *fig. 4*. The block is fixed in its place by being made dovetailed, and truly fitted into the

bottom of the cistern, so that the water will not leak by it. The end of it comes through the wood-work of the chest, and projects a small distance on the outside of it, being kept up to its place by a wedge, so that by withdrawing this wedge, the block becomes loose, and can be removed, to sharpen the cutters, as occasion requires. This is done on a grindstone, the plates being first separated from each other.

The cutters of the cylinder are fixed into grooves, cut in the wood of the cylinder, at equal distances from each other round its circumference, in a direction parallel to its axis: the number of these grooves is twenty; and for the washer, each groove has two cutters or bars put into it; then a fillet of wood is driven fast in between them, to hold them firm; and the fillets are kept fast by spikes driven into the solid wood of the cylinder. The beater is made in the same manner, except that each groove contains three bars, and two fillets, as shewn in *fig. 5*.

In the operation of the cylinder, it is necessary that it should be inclosed in a case, or its great velocity would throw all the water and rags out of the engine. This case is a wooden box *LL*, inclosed on all sides except the bottom: one side of it rests upon the edge of the vat, and the other upon the edge of the partition *BB*. The lines, *c, c*, represent the edges of wooden frames, which are covered with hair or wire-cloth; and immediately behind these, the box is made with a bottom, and a ledge towards the cylinder, which makes a complete trough. The dark spaces, *e, e*, in *fig. 1*, shew the situation of two openings, or spouts, through the side of the case, which lead to flat lead-pipes, *h, h*, *fig. 2*, which are placed by the side of the vat; the beam, *F*, being cut away for them. There are waste pipes, to convey away the foul water from the engine; for the cylinder, as it turns, throws a great quantity of water and rags up against the sieves: the water goes through them, and runs down into the trough at *e, e*, and from thence into the ends of the leaden pipes, *h, h*, *fig. 2*, by which it is conveyed away: *d, d*, *fig. 1*, are grooves for two boards, which, when put down in their places, cover the hair-sieves, and stop the water from going through them, if it is required to retain the water in the engine. This is always the case in the beating-engines, and therefore they are seldom provided with these waste-pipes, or at most on one side only; the other side of the cover being curved, to conform to the cylinder. Except this, the only difference between the washing-engine and the beater is that the teeth of the latter are finer, having 60 instead of 40 bars on its circumference; and it revolves quicker than the washer, so that it will cut and divide those particles which pass through the teeth of the washer.

In small mills, where the supply of water is limited, they frequently have but one engine, and use it both for washing and beating, by setting the screw so as to let the cylinder down and make its teeth cut finer; but the system of all considerable works is to have two engines, or four, if the supply of water is sufficiently great. We have seen a very capital paper mill containing five engines, where three of them are beaters and two workers; because the beating takes so much more time, that when the numbers are equal, the washers will often do too much for them, and they will have to stand still. A mill to drive four engines is generally made double, that is, it has two water-wheels, and all the machinery shewn in the plan; and if either of these give motion to three engines, they are arranged rather differently: thus the two beaters are placed on the same level with each other, and this removes them to a greater distance asunder than shewn in *fig. 1*, *Plate I.*; so that the ends of the two engines,

when placed on the same floor or platform, will just touch each other. The washer is then placed on the opposite side of the wheel *D*, *viz.* where the word *plan*, *fig. 2*, is written, its pinion being upon the summit of the wheel, which raises it to the proper level: the vat of the washer has a valve or cock in each end, to let out its contents into either of the beaters at pleasure.

The mills with spur-wheels, such as is given in our drawing, are not very common, though they work much better than the ordinary arrangement of the wheels for a paper mill: in this the shaft of the water-wheel has a large face, or crown-wheel, fixed upon it, which actuates a wooden trundle fixed upon a vertical shaft, proceeding upwards through the floor of the mill, and there it carries two large horizontal crown or face-wheels, giving motion to the pinions of the engines, which are situated on opposite sides of the upright shafts. It is necessary to have two horizontal wheels, because of the different levels at which the engines must be placed. These mills are generally made in wood, in a very rude and coarse manner, with crown-wheels and large cogs, so that the friction is very great. Their only recommendation to the paper-maker is their cheapness of erection; but this is only on account of their inferior workmanship, for to make a mill in iron with a vertical shaft and bevelled wheels, as they should be to work properly, would be far more expensive than the construction shewn in *fig. 1*, which is therefore adopted by those manufacturers who choose to have their mills made in a complete and durable manner.

The quantity of water which a paper mill can command to turn its engines, generally limits the extent of its trade; and hence the manufacturers should attend to every improvement of the machinery which can increase their effect. Where the supply of water is constant, they work the engines day and night, though the making the paper, as it requires many workmen, is of course carried on in the day time only. This system necessarily requires a large vat to be provided, which is called the *stuff-chest*, and is a general receptacle for the pulp, where it is kept till wanted to be made into paper; at the same time this mixes the pulp of different day's work together, and produces an uniformity in the quality and colour of the paper, which is a great recommendation for printing large editions of books.

A very large and capital paper mill, at Maidstone in Kent, which is the principal seat of the paper trade in England, is worked by steam-engines, and is found to answer very well. The machinery and building of a paper mill should be well made, and firmly put together, otherwise its great velocity, and power, produces a tremor, which in time shakes every thing to pieces. The noise and vibration of a washing-engine is most tremendous; for when it revolves 120 times *per* minute, and has 40 teeth, each of which passes by 12 or 14 teeth in the block at every revolution, it will make near 60,000 cuts *per* minute, and each of them sufficiently loud to produce the most horrible growling sound which can be conceived. The beater revolving quicker, having 60 teeth, and 20 or 24 cutters in the block, will make 180,000 cuts *per* minute, which is so rapid, as to produce a coarse musical note or humming, which may be heard at a great distance from the mill. This great number of cuts will account for an engine being able, in the course of four or five hours' working, to reduce a quantity of rags to those exceedingly minute filaments, of which paper is composed.

The operation of grinding the rags in the engines requires some management to produce the best effect: the operation of the washing-engine is to open the rags, and to separate their fibres from each other, rather than to cut them

PAPER.

them, and at the same time, by the stream of water which runs through, to carry off all dirt. At first putting into the washing-engine, they should be worked gently, not to cut, but only to rub the rags violently, that the water may have the best effect in carrying off the impurities: this is done by raising up the cylinder, so that its teeth do not touch the teeth of the block, for if the washer cut and divided the rags too much in the first instance, the water would carry away a considerable portion of the finest parts. The cock is at this time opened to admit a great stream of water. When this has continued 20 or 30 minutes, the bearing of the cylinder is let down so low, that its weight rests upon the teeth of the cutter, and it now begins to cut the rags in pieces, the supply of water is diminished, and the operation is at first very violent, the rags frequently causing the cylinder to leap up a considerable height. After working about three or four hours, the engine will get to work very steadily, because the rags, though not reduced to a pulp, are cut very small, and make less resistance to its motion: at this period the washing is usually concluded, and the contents of the engine, called *half stuff*, discharged into a large basket, which allows the water to draw away. For some kind of paper it is thought advisable to let the half stuff remain four or five days to *mellow*, or indeed ferment; and if fermentation is at all proper, this must certainly be the best stage for it, when all the mass of rags is brought to an equal state of division of the fibres. The bleaching is, as before-mentioned, sometimes performed upon the half stuff, instead of bleaching the rags previously; but more commonly it is done in the washing-engine, and this is the most convenient method of all, as it requires no apparatus, and takes very little time, puts the manufacturer to no other expence than the bleaching salt (muriate of lime) by which it is performed, and the effect, if well managed, is equal to that of bleaching by the oxymuriatic acid gas, as at first described. After the rags have been washed for four hours, as above-mentioned, if it is required to bleach the stuff in the engine, they stop the water from running in at the cock, and throw into the engine a quantity of bleaching salt, or muriate of lime. For fine rags, one or two pounds, more or less, are used, according to the quantity of rags the engine contains, which is usually one hundred weight: the two sliders, *d, d*, *fig. 1*, *Plate II.*, are put down in the cover of the cylinder, to prevent the water getting away. In this state the engine is worked about an hour for the bleaching to take place, and during this time the rags lose their colour; but this does not colour the water, though it is rendered rather white and milky by the salt. The very best rags, when first put into the engine, are of a very yellow and dirty colour; but they become, by the bleaching, a very perfect snow white: the cylinder is usually raised up a very little during the bleaching, which being concluded, the water-cock is opened again, the boards, *c, c*, are removed, and the washing continued about an hour to wash the salt away, which must be done very perfectly, or it will continue to act upon, and injure the quality of, the materials.

The half stuff is next put into the beating-engine, and worked till it becomes a fine pulp, which will generally take four or five hours, water being let into it at proper times, to dilute the pulp to its proper consistence, but no water is let out of the beating-engine as in the washer. The quantity of water requires great judgment, as it has an influence on the quality of the paper; and the kind of water the manufacturer is obliged to employ must be considered. The fairest water is the best for paper-making, on account of the clean and white quality so desirable in the manufacture. The water that dissolves soap best, is also

the fittest for taking the grease out of rags. Paper-makers say that the water which is most beaten, and that which comes from afar, makes a better curdled paper, stouter, and of stronger consistence, as to matter: if this is the case, it is probably because this water has had more time for depositing the slime, and other heterogeneous parts, and that, being more exposed to the air by motion, it is thereby in a better condition for dissolving grease and soap. Water, subject to be mudded by rain, and that which runs through marshy grounds, ought to be avoided. In like manner, a paper mill ought not to be placed below other manufactories or machinery, which, by using the same water, might communicate to it a bad quality. The water of ponds, and rain water, are very good for dissolving soap, and may therefore be used for paper, if in a pure state. Water, impregnated with lime, by having run off from chalky soils, is generally very pure and clear to the eye, and is, therefore, much used for paper-making, but it is apt to deposit a slight incrustation upon the brass wire of the moulds, which they remove by occasionally washing them with vinegar.

For printing papers, the sizing is done in the beating-engine, towards the end of its operation, as we shall describe: the size is necessary to prevent the ink from sinking into the paper like blotting-paper; but printing-ink not being so fluid as writing-ink, the paper can be sufficiently sized in substance, without subjecting the sheets to a separate operation after they are made. The size for the engine is composed of alum pounded very fine, and mixed up with a quantity of oil: about a pint and a half of this mixture, thrown into the engine at intervals, during the last half hour of the beating, is sufficient. In order to give that bloom, or blue cast to the paper, which some kinds have, a quantity of powder blue is frequently put into the engine at the same time. The pulp is now run off into the *stuff-chest* where the different kinds are mixed, and it is taken out as it is wanted, in the vats where the dippers, &c. work to form the sheets.

The moulding of the paper should be carried on in a lofty room, well ventilated, and with a smooth and even ceiling, that the steam arising from the several vats of pulp may not be condensed upon it, and fall in drops, for a single drop falling upon a sheet of paper, whilst it is moulding, will beat a hole through it, or at least spoil it. The people in this apartment work at the *vats*, with *moulds*, *deckles*, *felts*, *vat press*, and *wet press*. The *vat* used to contain the pulp is a tub, generally about five feet in diameter, and two and a half in depth. It is provided, on the upper part, with planks enclosed inwards, and even railed in with wood, to prevent any of the stuff from running over in the operation: a plank, pierced with holes at one of the extremities, is placed across the vat, and resting on the planks which surround the vat, forms a support to rest the mould upon, when a sheet of paper has been made, and it remains here a short time to drain off the superfluous water. The stuff in the vat is kept at a proper temperature, by means of a grate introduced at a hole in the side, and surrounded on the inside of the vat with a case of copper. For fuel to this grate charcoal or wood is used, and frequently, to prevent smoke, the wall of the building comes in contact with one part of the vat, so that the fire has no communication with the room where they make the paper. The paper is made into sheets upon the *mould* and *deckle*. The *mould* is a square frame, or shallow box, made of well-seasoned mahogany, and covered at the top with wire-cloth; its dimensions are an inch or an inch and a half larger than the sheet of paper intended to be made upon it. The wire-cloth of the mould is varied in proportion to the fineness of the paper and the nature of the stuff.

PAPER.

stuff. It consists of a number of parallel wires stretched across the frame, very near together, and tied fast through holes in the sides; also a few other stronger wires, extending across in a direction at right angles to the former, and a considerable distance asunder, the small wires being bound down to them by fine wire at the intersections. This may be readily understood, from the examination of a sheet of some kind of paper on which the marks of the wires remain, because the paper is thinner in those places where the wire touched it.

By a modern improvement, these marks, called water-marks, are avoided, and the paper has a smooth even surface. For this the wire is wove in a loom, exactly like cloth, and stretched over the frame of the mould. The wire-cloth is in this case made larger than the intended sheet of paper, and turned down over the sides of the frame, being sewed fast to it by fine wire, so that the cloth is strained tight over the frame. The wove paper, as it is called, when made on these moulds, is a very superior article to the old paper, particularly for books, but a prejudice still prevails in favour of the old paper with lines, which obliges manufacturers still to make it, though by no means so fine or good as the wove.

The *deckle* is a square frame of mahogany, bound with brass at the angles; it is made very thin, and its outside corresponds with the sides of the mould, while the inside is the size of the sheet. This frame is necessary to retain the stuff of which the paper is made on the cloth, and it must be exactly flat, that it may fit upon the wire-cloth of the mould, otherwise the edges of the paper will be ragged and badly finished. The deckle, when placed upon the wire of the mould, forms a shallow sieve or mould, in which a quantity of the pulp is taken up, and by the draining through of the water, the pulp is left in a sheet upon the wire. There is no fastening for the deckle, as it is moveable, and only held upon the mould, by the workman grasping the mould and deckle together in both hands at the opposite sides. This admits of the deckle being removed, that the sheet of paper may be taken up from the wire, by applying the mould upon a piece of felt. The *felts* are pieces of woollen cloth, spread over every sheet of paper, and upon which the sheets are *laid*, to detach them from the wire of the mould; they also prevent them from adhering together, and imbibing part of the water with which the paper is charged, transmit the whole of it when placed under the action of the *vat press*. The moulding of the paper is performed by three workmen, the *dipper*, the *coucher*, and the *lifter*. The first of these having filled the vat with pulp, must be attentive to mix it up well; for this purpose, he employs two implements, one of which is a simple pole, and the other a pole armed with a piece of board, rounded and full of holes. This operation is repeated as often as the stuff falls to the bottom. In the principal mills they use for this purpose what is called a *hog*, which is a machine within the vat, that, by means of a small wheel on the outside, is made to turn constantly round, and keep the stuff in perpetual motion.

When the stuff and water are perfectly mixed, it is easy to perceive whether the previous operations have been complete. If the stuff floats close, and in regular flakes, it is a proof that it has been well ground, and the parts of the rags, which have escaped the cylinder of the engine, also appear. The dipper stands in a niche, or hollow part of that kind of ledge or table which goes round the circumference of the vat; he holds a mould in both hands, by the two extremities, with the deckle applied exactly over the mould, as if only one piece; then inclining it a little

towards him, he dips it into the vat, and brings it up again into a horizontal position. The superfluous part of the pulp flows over on all sides, and the quantity thought sufficient is shaken gently, from the right to the left, and up and down horizontally, until it is equally extended over the whole surface of the mould. These two motions are also accompanied by a slight shake, that serves to fix and stop the sheet. As the water drains through the wire, the fibrous parts of the stuff arrange themselves regularly on the wire-cloth of the mould, not only in proportion as the water escapes, but also as the workman favours this effect, by gently shaking the mould. This done, the mould is immediately laid on the edge of the vat, the deckle taken off, and the mould made to slide along the board which is laid across the vat, to the part where the sheet is to be laid or taken off. The board, which is but two inches in breadth where the sheet is laid, is nothing more than a deal board, which runs along the length of the vat, and is pierced with several holes at the extremity, for letting the mould drain into the vat. The dipper taking the deckle off the first mould, places it immediately on a second, which is given him for dipping in its turn; and the second workman, called the *coucher*, taking the mould off the board that runs across the vat with the left hand, raises it gently, and lays it in an inclined position against one or two small pins, which are driven into the board on the edge of the vat. In this condition the mould remains two or three seconds of time for draining into the vat, whilst the *coucher* extends a felt, on which he applies the mould to take off the sheet, which being done he returns the mould to the dipper.

They proceed in this manner, laying alternately a sheet and a felt, till they have made six quires of paper, which is called a *post*, and this they do with such swiftness, that in many sorts of paper two men make upwards of twenty posts in a day.

When the last sheet of the post is covered with the last felt, all the workmen about the vat unite together, and submit the heap to the action of the *vat press*. They begin at first to press it with a middling lever, and afterwards with a lever about fifteen feet in length.

The dipper should be attentive, in distributing the matter on the mould, to reinforce the corner the *coucher* is to take hold of, in raising and extending the sheets; for without this precaution he would break a great many. Also, if he takes up too much matter with his mould, if he does not equally extend it, or if he strikes his mould against the drainer. In all these cases the matter is accumulated in certain parts of the mould, producing something like ridges in the paper, or if he lets the matter rest on the mould, and does not distribute it immediately, there will be parts of unequal thickness. When the vat is too hot, the stretching out of the sheet will be ill performed, because the water evaporates too soon from the mould. Add to this, that in letting the matter run towards one of the edges, by not giving his arm a regular motion, he may form a feather-edged paper, which may likewise happen if he does not extend his stuff sufficiently; or if the vat be too hot, or the scum of the pulp is too crude, and does not run well; if his arms are too stiff, and if he gives a bad shake, or if the mould be ill made.

In order to avoid drops of water, which, if they fall upon the paper, will make disagreeable spots, the mould should be raised readily; and as often as the *coucher* returns his mould to the drainers, he ought to be careful to shake his hands behind him; for without this precaution, his fingers, which are wet, would drop upon the sheet already laid, whilst he is covering it with the felt. If he is also too quick

PAPER.

in laying, the air detained and compressed under the sheet occasions a bloating, and makes some parts more clear than others.

In consequence of the construction of the mould, it is easy to perceive that the sheets of paper will take, and preserve, the impression of all the wires which compose it, and of the empty spaces between them. This is seen in examining a sheet of paper before the light, a greater opacity being found on both sides of each brass wire, than towards the middle of the space. This thickness is occasioned by the pulp, which the motion of the mould could not distribute, being stopped by the small wires, and still more by the large cross wires. This defect is completely remedied by the improvement of weaving the wire of the mould like cloth. The traces of the old wires are most evidently perceived on the side of the sheet which was attached to the mould, and on the other side they form an assemblage of rounded risings. In the paper which is most highly finished, the regularity of these impressions is still visible; therefore it is evident, that all the operations to which it is submitted, have chiefly in view to soften these impressions without destroying them; it is necessary, therefore, to attend to the combination of labour which operates on these impressions. The coucher, in turning the mould on the felt, flattens a little the rounded eminences, which are in relief on one of the surfaces, and occasions, at the same time, the hollow places made by the wire-cloth to be partly filled up; meanwhile the effort which is made in detaching the paper, produces an indefinite number of small hairs on every protuberant part of the sheet. Under the action of the prefs, first with the felts, and then without them, the perfecting of the grain of paper still goes on. The vestiges of the protuberances made by the wires of the mould are altogether flattened, and in consequence the hollows opposite them disappear also, but the traces formed by the interstices of the wire, in consequence of their thickness, appear on both sides, and are rounded by the prefs.

The grain of the paper is often disfigured by the felts when they are too much used, or when the wool does not cover the thread. In this case, when the paper is submitted to the prefs, it takes the additional traces of the warp and the wool, and composes a surface extremely irregular.

The two sides of the felt are differently raised, and that on which the hair is longest, is applied to the sheets which are laid down, and any alteration of this disposition would produce a change in the texture of the paper. The stuff of which the felts are made should be sufficiently strong, in order that it may be stretched exactly on the sheets, without falling into folds, and at the same time sufficiently pliant to yield in any direction, without injury to the wet paper. As the felts have to resist the reiterated efforts of the prefs, it appears necessary that the warp be made strong, of combed wool, and well twisted. On the other hand, as they have to imbibe a certain quantity of water, and to retain it, it is necessary that the wool be of carded wool, and drawn out into a slack thread.

The paper remains in the vat prefs during the time that the next post of paper is preparing, and when it is removed to make room for that, the business of the third workman, called the lifter, begins; it is to take the sheets off the felt, (for they are caused to adhere to them by the action of the prefs,) and then making the sheets up into a second pile; but if the coucher works too fast, and the lifter finds himself hard pressed, he cannot stretch out his sheets exactly upon one another, so as to make a neat and compact pile, which is very necessary to make paper of a regular and equal thickness, when put under a second or wet press, which is done as soon as several of the piles are completed, and can be collected together.

This second pressure being made with all the sheets in contact with each other, expresses a great quantity of water from the paper, and gives the sheet a very considerable strength; it also tends to take out those freckles on the surface of the sheets, which were occasioned by the impression of the felt, though it is necessary to have felts in the first pressure, because the paper is then so soft and pulpy, that it would be pressed into a solid mass if the sheets touched each other. The paper remains in the second press as long as it can, until another pile is made ready by the lifter. When the paper has undergone these operations, it is not only softened in the surface, but better felted, and rendered more pliant in the interior parts of the stuff. In short, a great part of the water which it had imbibed in the operation of the vat is dissipated. By the felting of paper is understood the approximation of the fibres of the stuff, and their interlacing so as to adhere close together. The paper is felted in proportion as the water escapes, and this effect is produced by the management and reiterated action of the prefs: without this action the paper would be porous, and composed only of filaments without adhesion. When the sheets are very thin, and it is found, after the second pressure, that they are formed by a fecula, which is still so saturated with a great deal of water, that they have little consistence, it is probable that the second press will join them to one another, and it is difficult to separate them; indeed they cannot well be taken off singly without tearing a great number. This is a proof that the business of the prefs has been badly conducted. To avoid this inconvenience, it is necessary to bring down the prefs at first gently, and by degrees with greater force, and to raise it as suddenly as possible. By this means the water, which is impelled to the sides of the heaps which has not yet escaped, returns to the centre, the sheets are equally dried, and the operation is executed without difficulty. The separation, sheet by sheet, is not necessary for drying, so that seven or eight may be taken together, which is called forming the pages; sometimes also a less number may do, when the paper is of a large size, but never less than three sheets are hung up together. It is of more importance than we are aware of, that the sheets should thus remain, as it were, pasted several of them together: if they were single, they could not resist the moisture of the size, yet this moisture is sufficient to facilitate their separation; but to prevent their separating when they are hung up to dry, they should be so placed that the pages may receive the wind in the surface, and not in the sides and edges. When the paper is removed from the second press, it is taken to the drying lofts, which are very extensive apartments, usually the upper parts of all the buildings of the mill: the sides are formed by luffer boards, which are a kind of lattice or boarding which can be opened or shut, to admit more or less air, at pleasure. The sheets are taken up upon a piece of wood like a T, and hung upon hair lines, stretched across large horizontal wooden frames, called *tribbles*, and these, as they are filled, are lifted up between upright posts to the top of the room, and retained by pegs put in the posts; then another frame being filled, is put up in its turn, and so on till the loft is filled from top to bottom.

The principal care in drying the paper, consists in gradually admitting the external air, and in preventing the cords from imbibing moisture; for this reason the lattices or luffer boards should be constructed with great exactness, and the cords may be prevented from imbibing the water by covering them with wax. In using such cords, the moisture does not continue in the line of contact between the paper and the cord, which prevents the sheet from stretching in that particular place by its weight, and from
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PAPER.

the folds which the moisture in the subsequent operations might occasion. The cords are of considerable thickness, by which means they diminish the point of contact, and give a better and more equal circulation to the air. By these precautions, the Dutch paper is dried equally, and is extremely supple before the sizing. The time necessary for drying the paper depends so much upon the state of the atmosphere, and the thickness of the sheets, that it cannot be stated with any degree of accuracy; but being dried, is taken down, and sleeked, dressed, and shaken, to make the dust fall out, and to separate the pages from one another. It is then laid in heaps in the warehouse, and from thence brought out in order to be sized. The size for paper is made of the shreds and parings got from tanners, curriers, and parchment makers. All the putrified parts, and the lime, are carefully separated from them, and they are inclosed in a kind of basket, and let down by a rope and pulley into the cauldron. This is a late invention, and serves two valuable purposes; it makes it easy to draw out the pieces of leather when the size is extracted from them by boiling, and easy to return them into the boiler, if the operation is not complete. When the glutinous substance is sufficiently extracted, it is allowed to settle for some time, and it is twice filtered before it is put into the vessel in which they dip the paper. Immediately before the operation, a certain quantity of alum is added to the size. The workman takes a handful of the sheets, smoothed and rendered as supple as possible, in his left hand, dips them into the vessel, and holds them separate with his right hand, that they may equally imbibe the size. After holding them above the vessel for a space of time, he seizes on the other side with his right hand, and again dips them into the vessel. When he has finished ten or a dozen of these handfuls, they are submitted to the action of the press. The superfluous size is carried back to the vessel by means of a small pipe. The vessel in which the paper is sized is made of copper, and furnished with a grate, to give the size, when necessary, a due temperature, and a piece of thin board or felt is placed between every handful of sheets, as they are laid on the table of the press. The Dutch are very careful in sizing their paper, to have every sheet in the same handful of equal dryness, because it is found that the dry sheets imbibe the size more slowly than those which retain some degree of moisture.

They begin by selecting the pages in the drying house, and after having made them supple, and having destroyed the adherence between the sheets, they separate them into handfuls, in proportion to the dryness, each of them containing that number which they can conveniently dip at one time. Besides this precaution, they take care to apply two sheets of brown paper, of an equal size, to every handful: this brown paper, being firm, solid, and already sized, is of use to support the sheets.

It is the practice at some paper mills, to carry the paper immediately it is sized to the drying house, and hang it up before it cools, sheet by sheet, on the cords; but particular attention must be paid to the lattices of the drying house, or it is apt to dry too fast, whereby a great part of the size goes off in evaporation, or if too slow it falls to the ground. The paper, being sufficiently dried for the last time, is carried to the building where it is examined, finished, and pressed: this is called the *Saul*. Women are here employed to remove all damaged and imperfect sheets: it is then put into the dry press, shewn at *figs. 6, 7, and 8, of Plate II.*, and squeezed with a most immense force, to render the paper flat, and give it a good surface. The lever of this press is fifteen or eighteen feet long, and ten or twenty

people are employed at the last to work it, though they sometimes use *Samson*, that is, a windlass like a crane, with which they purchase the lever of the screw; but this excessive labour is altogether avoided, and a much greater pressure given, by using Mr. Bramah's ingenious hydrostatic press, instead of the screw press, which consume a great portion of the power in friction. For a description of this, see *Press. Hydrostatic*. The dry press is generally large enough to hold two packs of ordinary paper, at once placed one at the other's side. When the compression is judged sufficient, the heaps of paper are carried back to the table, and parted, that is, the whole turned, sheet by sheet, in such a manner, that the surface of every sheet is exposed to a new one, and in this situation they are again brought under the press. It is in extending these two operations, sometimes to four or five times, or as often as the nature of the paper requires, that the perfection of the paper consists. If the stuff is fine, or the paper slender, the parting is less frequently repeated. In this operation it is necessary to alter the situation of the heaps with regard to one another every time they are put under the press; and also, as the heaps are highest towards the middle, to place small pieces of felt at the extremities, in order to bring every part of them under an equal pressure. A single man, with four or five presses, may part all the paper produced by two vats, provided the previous pressing is well performed. The work of the parting generally lasts about two days, on a given quantity of paper. The paper is now sorted into different lots, according to its quality and faults, after which it is made up into quires. The person who does this must possess great skill, and be capable of attention, because he acts as a check on those who separate the paper into different lots. He takes the sheets with the right hand, folds them, examines them, lays them over his left arm till he has the number requisite for a quire, then brings the sides parallel to one another, and places them in heaps under the table. An expert workman, if proper care has been taken in assorting the lots, will finish in this manner 6000 quires in a day. The paper is afterwards collected into reams of 20 quires each, and for the last time put under the press, where it is continued for 10 or 12 hours, or as long as the demand of the paper mill permits.

The operation of moulding the sheets of paper has, for some years past, been performed by a machine which produces it an endless and continued sheet, instead of moulding them separately one by one; and this it does with such accuracy and dispatch, that many paper-makers have procured machines, notwithstanding their great expense of erection, and the premium which they are obliged to pay the patentees for working them. The first idea of this curious machine was brought from France, but it has been wholly perfected here; and we think it one of the most important inventions, as applied to the manufactory of paper, which has been produced since the fourteenth century, when the method of making paper from linen rags was first discovered. In general, the progress of invention is slow and gradual; and with regard to the fabrication of paper, there have been very few striking improvements in relation to machinery for nearly a century, except the present. The processes for improving the general texture and appearance of the paper, by the more skilful use and application of sizing and hot-pressing, have certainly made important advances, even in the course of the last twenty years; while, for a much longer period, the modification in the machinery used for the conversion of rags into pulp, and of pulp into paper, have been very slight, and, for the most part, very unimportant.

Messrs. Henry, and Sealy, Fourdriner and John Gamble, are the proprietors of this invention, for which they have obtained

obtained several patents during its progressive stages of improvement; but an act of parliament was passed in 1807, to extend the usual term of all these patents to fifteen years from that period, and they then enrolled a specification in the records of Chancery, detailing the machine, in its most improved state, and from this we have taken the following description; though it is scarcely possible to describe such a very complicated machine without figures. The pulp having been prepared, in the usual manner, to due consistence, by the admixture of water, kept in motion in the vat by means of what are denominated hogs, is let out through several circular apertures in front of the vat, which can be narrowed or widened at pleasure, by means of a sliding plate. These apertures admit the pulp into a trough, which has a low side, or lip, and over the edge of this it flows, in a continued cascade, or even sheet: this trough of the vat is placed at one end of the machine, so that the stream of pulp falls upon a wire-cloth, or web, of many yards in length, the ends of which being united together, it is extended horizontally, in the manner of a jack towel, over two rollers, one of them placed close under the lip, or mouth of the vat, so that the stream of pulp descends as little as possible. The wire is kept supported by several other parallel rollers, that it may not hang down or bag, but be kept as level as possible, and by a very ingenious contrivance is kept extended in breadth to a proper tension; it therefore represents a table of several yards in length, which, by the revolution of the rollers, is kept in continual motion from the vat towards the end of the machine. The pulp is kept within bounds upon this table, according to the width intended to be given to the paper, by two pieces or rulers of wood, exactly parallel with each other, and also with the line of motion of the wire. Between the wire itself and these rulers are placed two endless straps of leather, as wide as the rulers, and revolving with the same velocity as the wire, but over different rollers. Similar rulers, and endless straps, are also placed in contact with the lower surface of the wire, so that the wire is confined between them on each side, and the liquid pulp thus prevented from running off on the sides, and they act as deckles to the mould. As they move together, they occasion no friction to destroy the wire. Near that part of the wire upon which the pulp falls from the lip in the vat, there is placed a flap of oiled silk, or other material, to prevent the pulp from running back towards the vat over the roller of the wire.

As the wire revolves upon its rollers, and carries the pulp along upon its surface from the vat to the other extremity, it is conducted between two rollers, fitted up in the manner of a rolling mill, which cause a pressure upon the pulp and paper to force out the water, and are therefore called the wet-presses. In order to guard the pulp, which before passing between the rollers is in a soft state, from being dislodged, or otherwise injured by the upper roller coming immediately in contact with it; a revolving endless web of felt is applied. This is made of the same width as the endless wire, but not so long, and it is extended, like that, upon rollers situated above the wires; it is likewise brought between the rollers of the wet-presses, so that its under surface falls upon the surface of the pulp, or paper, and defends it from the action of the upper cylinder: the wire and the felt are thus brought into contact with the paper between them, and the required pressure is given by means of screws, which increase or diminish the distance of the large compressing rollers, and these being covered with flannel cloth, or felting, are prevented from injuring the wire webbing, as well as producing a better effect upon the paper than naked cylinders would do.

To prevent the water thus pressed out of the pulp from running back upon the paper, the wire is not only made to descend before it passes the wet-press, but there is also placed a small roller resting upon the wire, as near the press as possible, and some part of the water is previously got rid of, by both the wire and felt, with the pulp between them, passing through a small pair of rollers, to the axis of the upper one of which rollers are hung weights, in order to give a slight pressure. The water that drains from the pulp is collected into a trough, and returned to the vat by means of a scoop-wheel instead of a pump, which might form the paper stuff into lumps or rolls, by the mutual friction or rubbing of any parts of the apparatus against each other, and the reason for returning the water into the vat is to prevent the loss of a considerable portion of the paper, stuff, blue, size, &c. which would otherwise be sustained by its running to waste.

It is evident then, that if motion is given in the proper direction to the wet-press cylinders, having both the web and wire thus compressed between them, they will be drawn along by them, and caused to revolve upon their respective rollers; and that, as long as these webs continue so to revolve, and the pulp continues supplied and running upon the surface of the under web, so long will the machine continue making a sheet of paper, of continually increasing length. But as the paper, even after having passed between the rollers of the wet-press, is not of that consistency and strength as would allow of its being removed from the machine and cut in sheets, the new-made paper is caused to detach itself from the wire, at the moment it comes to the extreme roller, over which the wire revolves, and is immediately received upon a second web of felt, which is, like the former, stretched by two principal rollers and other subordinate ones. By the revolution of this web, which must have the same velocity as the former, the paper is brought between two rollers of brass or other hard metal, which are turned perfectly smooth, and placed some distance from the wet-press cylinders, but exactly parallel to them, and after passing through them, the paper is received and wound upon a reel, or roller, which is from time to time removed, and others applied in their room as they are filled with paper.

This is the general action of the machine, but there are a number of very ingenious movements, which we have not mentioned. The shaking movement of the mould, which is so necessary to make the pulp coagulate into paper, is, in this machine, given to the wire thus: the frame of the roller on which the wire is extended at the end near the vat, is so placed on the top of upright legs, which are moveable on centres, as to admit the roller and wire with the deckle straps to move sideways a small quantity, and to return, in the manner of vibration, by the action of a crank. The number of these vibrations, or shakes, necessary in a given time, and the space passed through by the wire in each, will vary according to the quality and preparation of the pulp. The number, however, seems, by observation, to be limited to one or two hundred *per* minute, and the space between a quarter of an inch, and an inch. To enable the paper-maker readily to give a proper velocity to the crank according to his judgment, the same is turned by a small independent water-wheel, the velocity of which, and consequent number of vibrations, are regulated, at pleasure, by the quantity of water admitted upon the wheel. The sliding plate in the vat, which admits the pulp to flow out as first mentioned, is regulated by a screw, by which the circular aperture may be opened or shut in any intermediate degree, so that the quantity of pulp required to run from the

PAPER.

vat to the wire, may by this be regulated, and so adjusted to the velocity of the wire, as to produce a sheet of paper of any required thickness. The whole machine is turned by a water-wheel, which is preferable to any other power, as by it is obtained the most regular and uniform motion, and such as is best adapted for this purpose, though other first movers might be used.

As the paper is drawn off the endless wire by the motion of the revolving web of felt, it is necessary to have the riggers, or band-wheels, which communicate the motion from the rollers of the dry-press to those of the wet-press, made upon an adjustable principle, or capable of having their diameters increased or diminished, as occasion requires, whilst the machine is at work. By this adjustment, an exact correspondence is obtained between the velocity of the revolving wire and that of the revolving felting, so should one exceed the other in the smallest possible degree, the paper would either be torn asunder, or carried round upon the under side of the web, and be spoiled. It is effected by a very ingenious application of an expanding rigger; which see. The machine will make paper of any required width, by diminishing the distance between the deckles upon the wire; and for this purpose, the rollers over which the deckle straps are conducted, are adjustable upon their spindles. The long sheet of paper, thus obtained, is unrolled from the reel upon a cutting table, having grooves, with steel edges, placed at a proper distance; and thus the sheets, of the usual sizes, are cut off, by means of steel cutting wheels running into the grooves of the table, and pressed down by a loaded carriage. The reel of paper is placed parallel to these grooves, which are so much longer than the utmost width of the sheet, as is sufficient to let the carriage be retained on either side while a sheet is taken off the table, and fresh paper drawn on; in doing which, care is taken to keep the edges of the sheet at right angles to the grooves, for which purpose, direction lines are drawn upon the table. We have been informed by those who have seen these machines at work, that this method of cutting has been abandoned; and they are now worked with reels made adjustable to the required width of the sheet, and when a sufficient quantity is wound on it, is cut off by a knife, which, by cutting through the folds, divides the paper into separate sheets, which are ready for the operation of the second press. The machines are constructed with a cloth, so wide, that the continual sheet is cut up into two, and sometimes three in width, by which means it produces an immense number of sheets in a short time; but the greatest advantage is in making very large sheets, which it will do to almost any extent in length, and as much as two yards in width.

This machine is only adapted for making wove paper; but a patent has lately been taken out for carrying this invention farther, and making the paper with lines in it; but this is done with separate moulds, similar to those at present used, though worked by machinery, which in some measure resembles the other, the moulds being attached to an endless chain in lieu of the endless wire.

Chinese paper is of various kinds; some is made of the rinds or barks of trees, especially the mulberry tree and elm, but chiefly of the bamboo, and cotton tree. In fact, almost each province has its several papers. The preparation of paper made of the barks of trees, may be instanced in that of the bamboo, which is a tree of the cane or reed kind. The second skin of the bark, which is soft and white, is ordinarily made use of for paper: this is beat in fair water to a pulp, which they take up in large moulds, so that some sheets are above twelve feet in length: they are com-

pleted by dipping them sheet by sheet in alum water, which serves instead of the size among us, and not only hinders the paper from imbibing the ink, but makes it look as if varnished over. This paper is white, soft, and close, without the least roughness, though it cracks more easily than European paper, is very subject to be eaten by the worm, and its thinness makes it liable to be soon worn out.

The celebrated Dr. Franklin has, in the American Philosophical Transactions, given the following account of the method used by the Chinese for making these extremely large sheets of paper; suppose of four and half ells long, and half an ell wide. They have two large vats, each five ells long, and two ells wide, made of brick and lined with plaster, that holds water; in these the stuff is mixed ready to work. Between these vats is built a kiln, or stove, with two inclining sides, each side something larger than the sheet of paper; they are covered with fine stucco, that takes a polish, and are so contrived, as to be well heated by a small fire circulating in the walls. The mould is made with thin, but deep sides, that it may be both light and stiff. It is suspended at each end with cords, that pass over pulleys fastened to the ceiling, their ends connected with a counterpoise, nearly equal to the weight of the mould.

Two workmen, one at each end of the mould, lift it out of the water by the help of the counterpoise, turn it up, and apply it, with the stuff for the sheet, to the smooth surface of the stove, against which they press it, to force out a great part of the water through the wires. The heat of the wall soon evaporates the rest, and a boy takes off the dried sheet by rolling it up. The side next the stove receives the even polish of the studs, and is thereby better fitted to receive the impression of fine colours. If a degree of sizing is required, a decoction of rice is mixed with the stuff in the vat. Thus, the great sheet is obtained smooth and sized, and a number of the European operations, of uniting the edges of several small sheets together, are saved. If the stove has two polished sides, and there are two vats, the same operation is, at the same time, performed by two other men at the other vat, and one fire serves both.

We conclude with just hinting the importance, in the present state of our political relations, and the extreme difficulty of obtaining rags, of directing the attention of manufacturers to other substances, from which paper may be fabricated. Silk, it is well known, has been used in the East as long ago as the seventh century, but the article is too expensive for general adoption. Cotton, when treated in a manner similar to that practised with linen rags, affords an excellent paper, which at present forms a very extensive branch of the Levant trade.

The Japanese paper is, according to Kämpfer, made of the bark of the *morus papyrifera sativa*, or true paper tree. (See *JAPAN PAPER*.) Other substances are the pith of thistles, the bark of the fallow (*Salix caprea*), hemp, shaws of hemp, shaws of flax, hop bines, stalks of cabbage, of mallow, of common broom, of the sun-flower (*Helianthus annuus*), of mugwort, of clematis, &c. the down of the ear's-tail, the catkins of the white poplar, the husks of maize, flraw, &c. Trials of some of these, and especially of flraw, have been made in England as far back as the year 1799; but much remains to be done; and as the occasion is important, especially as it relates to commerce, and to the promulgation of arts and sciences, we should be happy to find, that some public-spirited individual, of enterprize and talent, would turn his attention to an extensive series of experiments; for the purpose of ascertaining the merits of these or other substitutes for linen rags, in the fabrication of paper for writing and printing.

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The excise duties on paper are subject, like other impositions of the same kind, to successive variation, both in their amount and rate; and so are likewise the bounties and drawbacks. And as, in the course of a few years, the enumeration of them would not only be useless, but erroneous, we shall content ourselves with observing, in general, that the principal act by which duties of excise are now collected, is the 43 Geo. III. c. 69; that by the 43 Geo. III. c. 81. more duties were added to those imposed by the former act, and by other subsequent statutes other duties increase the whole amount; and the particulars may be found in the schedules annexed to the several acts. We shall here subjoin some more permanent regulations.

Paper which hath paid the duty may be exported, and also books; and drawbacks are to be allowed subject to the regulations prescribed in several acts. (26 Geo. III. c. 78. 34 Geo. III. c. 20. 43 Geo. III. c. 69. sched. G.) The officer attending the packing of paper for exportation, shall take off the stamps from each ream or bundle, and any person obstructing him in this service shall incur a forfeiture of 50*l.* (26 Geo. III. c. 77.) By 49 Geo. III. c. 98. certain duties of customs are also payable upon papers; but old rags, old ropes or junks, or old fishing nets, may be imported duty free. (11 Geo. I. c. 7.) By 32 Geo. III. c. 54. Officers of the customs shall cause any printed, painted, or stained paper that is imported to be marked; and counterfeiting or forging the mark or number, subjects to a forfeiture of 100*l.*; and counterfeiting or forging any stamp or seal for making the impression, incurs a forfeiture of 500*l.*; and any person who shall sell paper with such counterfeit stamp, knowing the same, shall forfeit 50*l.* By 34 Geo. III. c. 20. the importation of books for sale, first printed in this kingdom, and reprinted in any other, incurs forfeiture of the same, and also 10*l.*, and double the value of such book; provided this shall not extend to any book that has not been printed or reprinted in this kingdom, within twenty years before the same shall be imported, &c.

Every maker of paper or pasteboard, and every paper-stainer, shall take out a license from the office of excise, annually, for which he shall pay 2*l.*, on pain of forfeiting 20*l.* (24 Geo. III. c. 41. 43 Geo. III. c. 69. sched. A.) All brown paper, made of old ropes, or cordage only, without separating or extracting the pitch or tar from them, and without any mixture of other materials, shall be deemed paper of the second class or denomination, and be chargeable with the duty accordingly; and all other paper whatever (glazed paper for clothiers and hot-pressers excepted) shall be deemed to be of the first class or denomination. (42 Geo. III. c. 94.) No paper shall be painted or stained for hangings, except that for which the duty on paper of the first class hath been charged, duly stamped, &c. (41 Geo. III. c. 8.) Nor is the maker to diminish any paper before it be charged, under the penalty of 50*l.* and also such paper. Pasteboard is to be made of paper charged, and unused for any other purpose, on pain of 100*l.*, together with forfeiture of the same, and utensils, &c. employed in making it. (42 Geo. III. c. 94.) By the same act, the maker of pasteboard shall produce to the officers all such paper as he intends to use for pasteboard, duly wrapped and stamped, after 24 hours' previous notice, on pain of 100*l.*: nor shall any maker of pasteboard be a paper-maker, nor manufacture within a quarter of a mile of a paper manufactory, on pain of 100*l.* Places of making or keeping paper, pasteboard, mill-board, scale-board, or glazed paper, all utensils and materials employed, shall be entered, on pain of forfeiture, and also of 50*l.* (34 Geo. III. c. 20.) All paper shall be made up into quires, each quire consisting of 24 sheets, and

such quires shall be made up into reams of 20 quires each; and all pasteboard, &c. shall be made up in parcels, each parcel containing even dozens of sheets, of one and the same denomination, and of equal dimensions, and not less than 24, nor more than 72 such sheets in every parcel; tied up, &c. in wrappers, and marked with the class of paper to which it belongs, the number of the reams made by the maker during the current quarter, &c. &c. on penalty of 200*l.* and forfeiture. (42 Geo. III. c. 94.) Every maker may make his paper into quires without folding, provided that such quires, when made up into reams, be separated by a slip of coloured paper placed between each quire, and visible on the outside of the ream, and that the outside quires of each ream consist of not less than 20, nor more than 24 sheets, at the option of the maker. Every maker, whose mill or workhouse is situated in any city or market-town, who shall have any paper, paste-board, &c. to be weighed, and charged with the duty, shall give 24 hours (elsewhere 48 hours) previous notice, in writing, to the officer of excise, who shall attend, and such maker, or his servant, shall produce to the officer all such paper, pasteboard, &c. duly tied up, that the duty may be charged previous to removal; stamps shall be provided by the commissioners of excise; and if any person shall counterfeit such stamps, and sell with such counterfeits, knowingly, he shall forfeit 500*l.* (34 Geo. III. c. 20.), but this penalty is repealed, and the person committing the offence is adjudged guilty of felony, and subjected to transportation, as a felon, for seven years. 47 Geo. III. sess. 2. c. 30.

Paper-makers are enjoined to give notice to the proper officers of their names, places of abode, store-houses, &c. and to make regular entries, on oath, every six weeks, of all paper, &c. made by them, on penalty of 50*l.* and the duty shall be paid in six weeks after entry, on pain of double duty. 34 Geo. III. c. 20.

Paper-makers are forbid to remove or to conceal their paper, &c. till the officer has taken account thereof, on penalty of 50*l.*, and forfeiture of the paper, &c. (24 Geo. III. c. 18. 34 Geo. III. c. 20. 42 Geo. III. c. 94.) Nor shall paper, &c. be removed in less than 24 hours, under the same penalty; nevertheless it may be removed from one mill to another, upon giving 48 hours' notice, in writing, to the officer. Paper that has been stamped and charged, is to be kept separate from other paper, and also paper of one class from that of another, on pain of 50*l.*

Persons molesting officers in the execution of this act (34 Geo. III. c. 20.) incur a penalty of 100*l.* and the penalties and forfeitures shall be appropriated, one moiety to the king, and the other moiety to the informer.

There is a drawback of the duties on paper exported; and also for books printed at Oxford or Cambridge, in the Latin, Greek, Oriental or Northern languages, and also for bibles, testaments, psalm-books, or books of common prayer, printed either in those universities, or by the king's printer, under certain conditions. 43 Geo. III. c. 69. sched. C.

Pasteboard, made of paper that hath paid the duty, shall not be charged with farther duty. (34 Geo. III. c. 20. 42 Geo. III. c. 94.) Allowance shall be made on paper damaged, for which the duty hath been paid; upon seven days' notice: and allowance shall be made to clothiers and hot-pressers; on certain conditions. 42 Geo. III. c. 94. 43 Geo. III. c. 69.

Stained paper (besides the duty paid for the paper before staining) is subject, by the former acts, to a duty of 1*¼d.* a yard square. 43 Geo. III. c. 69.

Papers are of various kinds. With regard to colours,

they may be divided into *white, brown, blue, &c.* With regard to quality, into *fine, second, bastard, superfine, &c.* With regard to use, into *writing, printing, pressing, cap, cartridge, copy, chancery, post, &c.* With regard to dimensions, into *demy, medium, fool's-cap, pot, royal, super-royal, imperial, elephant, atlas, &c.* With regard to country, into *German, Lombard, Rochelle, Genoa, Holland, &c.*

French paper is divided into *large, middle, and small.* To the small belong those called *petit Romaine, petit Raisin,* or *Bâton royal, petit nom de Jesus,* and *petit à la main,* all thus denominated from the marks impressed on them in making. Also the *cartier,* for the backs of playing cards; *pot* for the figure side; *couronne,* which has commonly the arms of the comptroller-general of the finances; *telliere,* with the arms of the late chancellor Tellier, and a double T; and *champany,* or *à chajis la serpente,* so called from its mark, the serpent; which being extremely fine and thin, is used by fan-makers.

To the middling sort belong the *grand raisin simple, carré simple, cavalier,* and *lombard,* the three last of which are for printing; *l'ecu,* or *de compte simple, carré double, l'ecu double, grand raisin double,* and *couronne double,* which three last are denominated *double* on account of their strength and thickness. Add to these the *pantalon,* or paper with the Dutch arms; and *grand cornet,* so denominated from the impression on it.

To the larger belong the *grand Jesus, petit et grand fleur-de-lis, chapelet, colombier, grand aigle, dauphin, soleil,* and *l'étoile,* which are thus called from the figures they bear, being all proper for printing either at the letter-press or rolling-press; also for merchants books, and for drawing on. The *grand monde* is the largest of all. Vide Savar. D. de Comm. tom. ii. p. 965, seq.

We have also *printed paper,* for hanging rooms. (See PAPER-hangings.) *Stamped paper,* to write obligations, deeds, and contracts upon. (See STAMP.) *Ruled paper,* for books of accounts, &c. To which may be added *cut paper,* and *gilt paper,* for letters, &c. See GILDING of Paper.

PAPER, *Blue,* is a sort used by tradesmen to wrap up goods; as sugar-loaves, pieces of linen, &c.

PAPER, *Blotting,* is paper not sized, and in which therefore ink readily sinks or spreads. It is used in books of account, &c. in lieu of sand, to prevent blotting and disfiguring the opposite pages. The same kind is likewise used by apothecaries in filtrating juices, and other matters, for which the *manica Hippocratis* is not so proper.

PAPER, *Teint,* or *demi-teint,* for designing on, is either *brown, blue, or bisterd.*

PAPER, *Bisterd,* is white paper washed over with a sponge dipped in foot-water. Its use is to save the labour of the crayon, in places which are to be shadowed the same depth with the teint of this paper. For light places, they are made thereon with white chalk. Vide Corneil. Elem. de la Peint. Prat. cap. 15, p. 35, seq.

PAPER, *Marbled,* is a sort of paper variously stained, or painted as it were with divers colours; made by applying a sheet on the surface of a liquor wherein colours diluted with oil or ox's gall are suspended.

The manner of making it is thus: a trough is provided of the shape and dimensions of a sheet of the paper to be marbled, and about four fingers deep: this is made of lead or wood well joined, and pitched or primed to contain the liquor. For the liquor, a quarter of a pound of gum tragacanth is macerated four or five days in fair water; this they stir from time to time, and add to it daily fresh water, till it be of a consistency somewhat thinner than oil; then they strain it into the trough.

The colours to be applied thereon, for blue, are indigo ground up with white lead, or Prussian blue and verditer may be used: for green, indigo and orpiment, the one ground and the other tempered, mixed and boiled together with common water; or verdigris, a mixture of Dutch pink and Prussian blue, or verditer, in different proportions: for yellow, orpiment bruised and tempered; or Dutch pink and yellow ochre: for red, the finest lake, ground with raspings of Brasil wood, which has been prepared by boiling half a day; or carmine, rose pink, vermillion, and red-lead; the two latter of which should be mixed with rose pink or lake, to bring them to a softer cast: for orange, orange lake, or a mixture of vermillion, or red lead, with Dutch pink: for purple, rose pink and Prussian blue. Into all these colours, properly ground with spirit of wine, they put a little ox or fish gall, which is two or three days old; and if the colours dilate not of themselves sufficiently, they add more gall: on the contrary, if they spread too much, the gall is over-dosed, and must be corrected by adding more of the colour without gall.

For the operation of marbling, when the guin is well settled in the trough, they extend a sheet of paper, and plunge it very shallow into the liquor, suddenly lifting it out again, in order to stir up, and raise the subsiding gum towards the surface, and for the more universal impregnating of the liquor.

This done, and all the colours ranged in gallipots on the table, where also the trough is placed, they begin by dipping a brush of hog's hair into any colour, commonly the blue first, and sprinkle it on the surface of the liquor: if the colour has been rightly prepared, it will dilate itself duly therein. This done, the red is applied in the like manner, but with another pencil: after this the yellow: lastly the green. For white, it is made by only sprinkling fair water, mixed with ox's gall, over the liquor.

When all the colours are thus floating on the liquor, to give them that agreeable cambletting, which we admire in marble paper, they use a pointed stick; which being applied by drawing it from one side of the trough to the other, with address, stirs up the liquor and fluctuating colours; then with a comb, made of wood, about five inches long, with brass teeth, about two inches in length, and a quarter of an inch distant from each other, taken by the head with both hands, they comb the surface of the liquor in the trough, from one extreme to another, permitting only the teeth to enter: this being performed with a gentle and uniform motion, makes those clouds and undulations on which the beauty of the paper depends.

If it be farther desired to have the colours lie in any other fantastical posture, representing serpents, or the like, it is effected with the pointed stick above-mentioned, by drawing it over what has been already combed; but this must be done with a dextrous hand, and with a shallow dip into the liquor, circling, as if you would draw some flourish, or figured letter.

Lastly, the colours being in this posture, the operator displays and applies on them a sheet of white moistened paper; to do which, artful like, requires a sleight only to be obtained by practice; because the surfaces of the liquor and the paper are to meet equally in all parts; which done, before the colours have time to soak through, which, unless the paper be very thick, will be in the space of two or three pulses, he lifts up the paper nimbly, and with an even hand; and then, after spreading it a while on a board, hangs it on a line to dry; which, when sufficiently done, they first rub it with a little soap, and then polish it with a marble

stone, ivory knob, or glass polishers; or with a burnisher of jasper or agate.

It must be observed, that the sprinkling of the colours is to be renewed, and all the other ceremonies performed with the stick and comb, at every application of fresh paper, by reason that every paper takes off all the colour from the liquor. Vide Kirch. de Luce & Umbra, lib. x. par. 2. cap. 4. Merr. Observ. on Neri de Art. Vitr. cap. 42. p. 312. Hought. Collect. tom. ii. p. 419, seq.

Some attempts have been made to enrich the marbling, by mixing gold and silver with the colours; which succeeded well in many attempts in the French king's library, though the expence has hindered the practice from obtaining. Savar. ubi supra.

Mr. Boyle tells us, that paper, besides its common uses, may be made into frames for pictures, fine embossed work, and other parts of furniture. For this purpose, a convenient quantity of the best white sort may be steeped for two or three days in water, till it becomes very soft; then reducing it by the mortar and hot water into a thin pulp, it is laid on a sieve to draw off its superfluous moisture; then putting it into warm water, wherein a considerable quantity of fresh glue, or common size, has been dissolved, it may afterwards be put into moulds to acquire the designed figure; and when taken out may be strengthened, as occasion requires, with plaster, or moistened chalk, and when dry painted or overlaid.

This hint is since improved into a regular manufacture, under the name of *papier machée*.

Another use of paper is to stop up cracks or fissures in wooden vessels to hold water; for, in this case, it will forcibly dilate, and fill the place in which it is to lodge.

PAPER, *Chinese*, is of various sorts; some is made of the rinds or barks of trees, especially those abounding in sap, as the mulberry-tree and elm, but chiefly of the bamboo and cotton-tree; but, in reality, almost each province has its peculiar paper; that of Se-tchuen is made of hemp; that of Fo-kiang, of soft bamboo; that used in the northern provinces, of the bark of the mulberry-tree; that of the province of Che-kiang, of wheat or rice-straw; that of the province of Kiang-nang, of the skin found in the silk-worms balls; in fine, in the province of Hu-quang, the tre-chu, or ko-chu, furnishes the principal material for paper.

As to PAPERS made of the barks of trees; the manner of their preparation may be exemplified in the instance of that of the bamboo, a tree of the cane or reed kind, being hollow, and divided into joints; but much larger, smoother, harder, and stronger, than any other sort of reed.

For this paper, they ordinarily only use the second coat or skin of the bark, which is soft and white; this they beat in fair water to a pulp, which they take up in very large moulds or frames, so that they have sheets ten or twelve feet long, and sometimes more. They are completed by dipping them sheet by sheet in alum-water, which serves instead of the size used among us; and not only hinders the paper from too freely imbibing the ink, but gives it that lustre which at first sight makes it look silvered, or at least varnished over.

The paper thus made is white, soft, and close, without the least roughness to stop the motion of the pen, or occasion the rising of any of its fibres; though being made of the bark of a tree, it cracks more easily than the European paper: add that it is more apt to take moisture, that the dust sticks to it; and that the worms soon get into it; to prevent which last inconveniency, they are obliged often to beat their books and expose them to the sun. Add, that its thinness making it liable to be soon worn out, the Chinese

are under a frequent necessity of renewing their books, by fresh impressions taken from their blocks. Vide Le Compt. Nouv. Mem. sur Chin. lett. 7. Kust. Bibl. Nov. Libr. an. 1697, p. 67, seq. Lett. Edif. & Cur. tom. xix. p. 479.

But the paper of the bamboo, it is to be observed, is neither the best, nor the most used, in China. In the former of these respects, it yields the priority to the paper made of the cotton-shrub, which is the whitest and finest, and at the same time least subject to the inconveniencies above-mentioned; because it keeps as well, and is as durable, as the European paper.

Dr. Grew thinks we may have plants in England, which contain a down that in all probability would make as fine a paper as that made by the Chinese, from their cotton-shrub. By which it appears he mistakenly imagined that the Chinese paper was made not from the rind of the cotton-shrub, but from the down or cotton itself. Vide Grew Mus. Reg. Soc. par. ii. sect. i. cap. 5. p. 215.

But the paper in most common use in China, is that made of the tree called *chu ku*, or *ku chu*, which Du Halde compares, first, to a mulberry-tree, then to a fig-tree, then to a sycamore tree, and lastly, to increase the embarrassment, to a strawberry-tree. By all which, we know no more of it than if he had said nothing about it.

The method of preparing it for paper, is by first scraping off lightly the thin outside of the tree, which is greenish: then they take off the inner rind in long thin slips, which they blanch in water, and in the sun; and afterwards prepare them in the same manner as the bamboo. It must not be forgot, that in the other trees it is only the inward bark that serves for making paper; but the bamboo, as well as the cotton-shrub, have this peculiarity, that not only their bark, but their whole substance, may be employed, by means of the following preparations.

Out of a wood of the largest bamboos, they select shoots of a year's growth, which are about the thickness of the calf of a man's leg: these they strip of their first green rind, and split them into straight pieces of six or seven feet long; the pieces thus cleft, they steep in a pond of muddy water, till they rot and grow soft by the maceration. In a fortnight they take them out, wash them in clean water, spread them in a large dry ditch, and cover them with lime for a few days; then they take them out again, and having washed them a second time, they slip them into small filaments, which they expose in the sun to dry and whiten: they throw them into large coppers, where they are thoroughly boiled: and lastly, reduce them by the strokes of large hammers to a thin palle or pulp.

After this, they take some shoots of a plant called *ko-teng*; they soak them four or five days in water, till there come out an unctuous sily sort of juice; this they mix with the pulp of which the paper is to be made, somewhat in the same manner as painters temper their colours; care being taken not to put in too much, nor too little of it; on which the goodness of the paper much depends.

When they have mixed the juice of ko-teng with the cleft bamboo, and beaten the whole till it resembles a thick clammy water, they pour it into a large deep reservoir, consisting of four walls, raised breast high, and having the sides and bottom so cemented, that the liquor cannot run out, nor soak in.

This being done, and the workmen placed at the sides of the reservoir, they dip in their moulds, and take up the surface of the liquor, which almost instantly becomes paper; the mucilaginous and gluey juice of the ko-teng binding the parts, and rendering the paper compact, soft, and glossy, qualities

PAPER.

qualities which the European paper never has when first made.

To harden the sheets, and make them bear ink, they dip them into alum water: this operation is called *fining*, from the Chinese word *fan*, which signifies *alum*. The manner is this: six ounces of fish glue, cut very small, are put in divers porringers of water, which they afterwards boil up, stirring it all the time to prevent lumps: when the whole is reduced to a liquid substance, they throw into it three quarters of a pound of calcined alum, which they melt and incorporate with it.

This mixture is next poured into a wide basin, across which is laid a small round stick; then they shut the edge of each sheet in another cleft from end to end, and in this manner dip the sheet, gently drawing it out as soon as it is wetted, by sliding it over the round stick. When the whole sheet has been passed nimbly through this liquor, which makes it whiter, and more compact, the long stick that holds the sheet by the edge is stuck into a hole in the wall, and the sheet hung up to dry.

As to the mould, with which they take up the sheet, its frame is so contrived, that it may be raised or lowered at pleasure; and its bottom is not made with wire as ours, but with little slender slips of bamboo, drawn several times through holes made in a steel plate, whereby they are rendered as fine as wire: they are then boiled in oil till thoroughly soaked, that the mould may enter lightly into the water, and not sink deeper than is requisite to take up matter enough for a sheet.

To make sheets of any extraordinary size, care is taken to have a reservoir and mould large in proportion. This mould is sustained by strings which pass over the pulley; and the moment these pull up the frame, the workmen, placed aside the reservoir, assist to take the sheet off; working together in a regular manner. See PAPER *supra*.

For drying the sheets when taken off, they have a hollow wall, whose sides are well whitened: at one end of it is an aperture, through which, by means of a pipe, they convey the heat of a neighbouring furnace: and at the opposite end is a small vent to let out the smoke. By help of this sort of stove, they dry the paper almost as fast as it is made.

Silvering of paper, as it is called, is another secret among the Chinese, practised at a very small charge, and without using any silver. In order to this, they take two scruples of glue, made of neats-leather, one scruple of alum, and half a pint of clean water: these they simmer over a slow fire, till the water is consumed, that is, till no more steam arises; then on a smooth table they spread some sheets of paper, and on this, with a pencil, they apply two or three layers of the glue: then they take a powder made of talc boiled, and mixed with one-third the quantity of alum; the two are ground together, sifted, and the powder boiled again in water, then dried in the sun, and lastly pounded again. This powder they sift through a fine sieve, spreading it uniformly on the sheets prepared as above: after which they hang them in the shade to dry; and this effected, they lay them again on the table, and rub them gently with clean cotton to take off the superfluous talc, which serves a second time for the same purpose. With this powder, diluted in water, mixed with glue and alum, they draw any figures at fancy on the paper. Vide Du Halde, *Descr. Chin.* tom. i. p. 368.

The era of the invention of paper, among the Chinese, was, according to Martini, about 160 years before Christ.

PAPER, *Japan*. Paper is made in Japan of the bark of the *morus papyrifera sativa*, or *true paper-tree*, after the following manner: every year, when the leaves are fallen off,

or in the tenth Japanese month, which commonly answers to our December, the young shoots, which are very succulent, are cut off into sticks about three feet long, or something less, and put together in bundles to be afterwards boiled with water and ashes. If they should grow dry before they can be boiled, they must be first soaked in common water, for about twenty-four hours, and then boiled. These bundles, or faggots, are tied close together, and put upright into a large kettle, which must be very well covered, and then they are boiled till the bark shrinks so far as to let about half an inch of the wood appear naked at the top. When the sticks have all been sufficiently boiled, they are taken out of the water, and exposed to the air till they grow cold, then they are slit open lengthways, for the bark to be taken off, which being done, the wood is thrown away as useless, but the bark dried and carefully preserved, as being the substance out of which they are in time to take their paper, by letting it undergo a farther preparation, consisting in cleansing it a-new, and afterwards picking out the better from the worse. In order to this, it is soaked in water three or four hours, and being grown soft, the blackish skin which covers it is scraped off, together with the green surface, of what remains, which is done with a knife, which they call *kaadsi kusaggi*, that is, a *kaadsi razor*; at the same time also the stronger bark, which is a full year's growth, is separated from the thinner, which covered the younger branches, the former yielding the best and whitest paper, the latter only a dark and indifferent sort. If there is any bark of more than a year's growth, mixed with the rest, it is likewise picked out, and laid aside as yielding a coarser and worse sort of paper; all gross knotty particles, and whatever else looks in the least faulty and discoloured, is picked out at the same time, to be kept with the last coarse matter.

After the bark has been sufficiently cleansed, and prepared and sorted according to its different degrees of goodness, it must be boiled in clear ley. From the time it begins to boil, they keep perpetually stirring it with a strong reed, pouring from time to time so much fresh ley in as is necessary to condense the evaporation, and to supply what hath been already lost by it; this boiling must be continued till the matter is grown so tender, that being but slightly touched with the finger it will dissolve and separate into flocks and fibres. Their ley is made of any sort of ashes, in the following manner: two pieces of wood are laid across over a tub and covered with straw, on which they lay wet ashes, and then pour boiling hot water upon it, which, as it runs through the straw into the tub underneath, is imbued with the saline particles of the ashes, and makes what they call ley.

After boiling the bark as above described, follows the washing of it, which is of no small consequence in paper-making, and must be managed with great judgment and attention; if it hath not been washed long enough, the paper will be strong, indeed, and of a good body, but coarse and of little value; and if, on the contrary, the washing has been too long continued, it will afford a whiter paper, but such as will not bear ink. This part of paper-making, therefore, must be managed with the greatest care and judgment, so as to keep to a middle degree, and avoid either extreme. They wash it in a river, putting the bark into a sort of sieve, which will let the water run through, and stirring it continually with the hands and arms, till it comes to be diluted into a delicate soft pulp, or mucilage. For the finer sort of paper the washing must be repeated; but the bark must be put into a piece of linen, instead of a sieve, because the longer the washing is continued the more the bark

PAPER.

bark is divided, and would come at last to be so thin and minute, that it would run out at the holes of the sieve and be lost, and at the same time also, what hard knots or flocks, and other heterogeneous useless particles remain, must be carefully picked out, and put up with a coarser sort of bark for worse paper. The bark having been sufficiently washed, is put upon a thick, smooth, wooden table, in order to its being beaten with sticks of the hard *kufnoki* wood, which is commonly done by two or three people, until it is wrought fine enough, and becomes withal so thin, as to resemble a pulp of baked paper, which being put into water will dissolve and disperse like meal.

The bark, being thus prepared, is put into a narrow tub, with the fat slimy infusion of rice, and the infusion of the *oreni* root, which likewise is very slimy and mucilaginous. These three things being put together must be stirred with a thin clean reed, till they are thoroughly mixed and wrought into an uniform liquid substance, of a good consistence; this succeeds best in a narrow tub, but afterwards the mixture is put into a larger one, which is not unlike those made use of in our paper-mills; out of this tub the leaves are taken off one by one, on proper patterns made of bulrushes, instead of brass wire, called *mys*. Nothing remains now but a proper management in drying them; in order to this they are laid up in heaps, upon a table covered with a double matt, and a small piece of reed is put between every leaf, which standing out a little way, serves, in time, to lift them up conveniently, and take them off singly. Every heap is covered with a small plank or board, of the same shape and size with the paper, on which are laid weights, first, indeed, small ones, lest the leaves, being then wet and tender, should be pressed together into one lump, but, by degrees, more and heavier, to press and squeeze out all the water. The next day the weights are taken off, the leaves are lifted up one by one, by the help of the small stick above mentioned, and with the palm of the hand, clapped to long rough planks made for this purpose, which they will easily stick to, because of the little humidity still remaining. After this manner they are exposed to the sun, and when quite dry, taken off, laid up in heaps, pared round, and so kept for use or sale.

It has been observed, that the infusion of rice, with a gentle friction, is necessary for this operation, because of its white colour, and a certain clammy fatness, which at once gives the paper a good consistence, and pleasing whiteness. The simple infusion of rice-flour will not do it, because it wants that clamminess, which, however, is a very necessary quality. The infusion spoken of is made in an unglazed earthen pot, wherein the rice grains are soaked in water, and the pot afterwards shaken, gently at first, but stronger by degrees; at last, fresh cold water is poured upon it, and the whole percolated through a piece of linen. The remainder must go under the same operation again, fresh water being put to it, and this is repeated so long as there is any clamminess remaining in the rice. The Japanese rice is by much the best for this purpose, as being the whitest and fattest sort growing in Asia.

The infusion of the *oreni* root is made after the following manner: the root pounded, or cut small, is put into fresh water, which in one night's time turns mucilaginous, and becomes fit for use, after it has been strained through a piece of linen. The different seasons of the year require a different quantity of water to be mixed with the root. They say the whole art depends entirely upon this. In the summer, when the heat of the air dissolves the jelly, and makes it more fluid, a greater quantity is required, and less in proportion in the winter, and in cold weather; too much of this infu-

sion mixed with the other ingredients will make the paper thinner in proportion; too little, on the contrary, will make it too thick, therefore a middle quantity is required to make a good paper, and of an equal thickness; however, upon taking out a few leaves, they can easily see whether they have put too much or too little of it. Instead of the *oreni* root, which sometimes, at the beginning of the summer, grows very scarce, the paper-makers make use of a creeping shrub, called *sane kadfura*, the leaves of which yield a mucilage in great plenty, though not altogether so good for this purpose, as the mucilage of the above mentioned *oreni* root. They also use the *juncus sativus*, which is cultivated in Japan with great care and industry. It grows tall, thin, and strong; the Japanese make sails of it, and very fine matts to cover their floors.

It hath been observed above, that when the leaves are fresh taken off from the patterns, they are laid up in heaps, on a table covered with two matts. These two matts must be of a different fabric, one, which lies lowermost, is coarser, but the other, which lies uppermost, is thinner, made of thin, slender bulrushes, which must not be twisted too close one to another, but so as to let the water run through with ease, and very thin, not to leave any impression upon the paper.

A coarser sort of paper, proper to wrap up goods, and for several other uses, is made of the bark of the *kadse kadfura* shrub, after the method above described. The Japanese paper is very tight and strong, and will bear being twisted into ropes.

A thick strong sort of paper is sold at Siriga (one of the greatest towns in Japan, and the capital of the province of that name), which is very neatly painted and folded up, so much in a piece as is wanted for a suit; it looks so like silken or woollen stuff, that it might be mistaken easily for them. A thin neat sort of paper, which hath a yellowish cast, is made in China and Tonquin, of cotton and bamboos: at Siam, the Siamites make their paper of the bark of the *pliook-kloi* tree, of which they have two sorts, one black and the other white, both very coarse, rude and simple, as they themselves are. They fold it up into books, much after the same manner fans are folded, and write on both sides, not, indeed, with a pencil, in imitation of those more polite nations who live farther east, but with a rude stylus made of clay.

Thus far we have given a description of the way of making paper in the East, which the late learned Bemannus was so desirous to know, and so earnestly intreated travellers to enquire into, being, however, mistaken, in supposing that it was made of cotton, whereas it evidently appears by this account, that all the nations beyond the Ganges make it of the bark of trees and shrubs. The other Asiatic nations on this side the Ganges, the black inhabitants of the most southernmost parts excepted, make their paper of old rags of cotton stuff, and their method differs nothing from ours in Europe, except that it is more simple, and the instruments they make use of are grosser. See *SON*.

PAPER, Flock, is a kind of paper-hanging, lately invented, which is embossed by means of chopt cloth. The paper designed for receiving the flock is generally first prepared with a varnish ground, of a proper colour; and it is not uncommon to print some mosaic, or other small running figure, in colours, on the ground, before the flock is laid on: this may be done with any pigment of the colour desired, tempered in varnish, and laid on by a print cut for the purpose.

The manner of laying on the flock is either by means of a print, or by a stencil. But as the stencil can execute nothing
but

PAPER.

but detached parts, and consequently is unfit for all designs where running work, scrolls, or other more complicated ornaments are introduced; it is extremely confined, with respect to the nature of the designs for which it can be employed; and the print is therefore most generally preferred. The method of laying on the flock by means of a print is this: a wooden print being cut (see *PAPER-hangings*) in such manner, that the part of the design, which is intended for the flock, may project beyond the rest of the surface, the varnish is put on a block covered with leather, or oil-cloth, and the print is then used to lay the varnish on all the parts where the flock is to be fixed. The sheet, thus prepared by the varnished impression, is now to be removed to another block or table; and to be strewn over with flock: which is afterwards to be gently compressed by a board, or some other flat body, to make the varnish take the better hold of it. Then the sheet is to be hung on a frame till the varnish be perfectly dry; at which time the superfluous part of the flock is to be brushed off by a soft camel's-hair brush, and the proper flock will be found to adhere in a very strong manner. When the stencil is used, the same method is to be pursued: the varnish for holding the flock being laid on by that instead of a print; and the flock afterwards strewn upon it, as in the other case.

The usual method of preparing the flock is, by cutting woollen rags, or pieces of cloth, with the hand, by means of a large bill or chopping-knife. But it is much more easily and better done by a machine; which may be worked by a horse-mill, at the same time such mill is employed for cutting diamonds, or any other similar purpose. In such case, the construction of that part of the machine, which is made for the cutting the flock, is this.

A box is made for containing the rags or cloth to be cut; which is open at the top; and of such size, as may best suit the quantity of rags that the force employed can cut. A blade is also to be made, the length of which is to be equal to the breadth of the box; and it should be strong; and must be charged with as great a weight as the force employed can be made to raise with a quick motion. The box being filled with the rags or cloth to be cut, is placed under the blade, and made to move by hitches, after the stroke of the blade is given, just so far as where it is proper the blade should again cut the cloth or rags; while, at the same time, the blade is lifted up, and let fall on the cloth, which it cuts through, till by successive strokes, and the progressive motion of the box under it, the whole quantity of cloth or rags in the box has been cut. The box must then be turned, so that one of the sides may become the front; and the operation must be repeated; by which means the cloth or rags, having been cut both ways, will be reduced to the state in which the matter is called flock; and fit to be employed for the purpose of paper-hangings. The work necessary for conveying from the principal mover in the mill, the motion for thrusting forward the box, and raising the blade, may be easily supplied by any ingenious wheelwright, and need not therefore be particularly described here.

There is a kind of counterfeit flock-paper, which, when well managed, has very much the same effect to the eye as the real: though done with less expence. The manner of making this sort is, by laying a ground of varnish on the paper; and having afterwards printed the design of the flock in varnish, in the same manner as for true; instead of the flock, some pigment, or dry colour, of the same hue with the flock required by the design, but somewhat of a darker shade, being well powdered, is strewed upon the printed varnish, and produces greatly the same appearance. Handmaid to the Arts, vol. ii. p. 458, &c.

PAPER-hangings are of several kinds; some of which are made in the representation of stucco-work, for covering ceilings, or the sides of halls, stair-cases, passages, &c. and others in imitation of velvet, damask, brocades, chintzes, or such silks and stuffs as are employed for hanging rooms.

The principal difference in the manufacture lies in the grounds; some of which are laid in varnish, and others in the common vehicles for water colours.

The kind of paper employed for this use is a sort of cartoon, manufactured for the purpose, which must be stamped before it be painted. 1 Geo. stat. 2. c. 36.

The colours proper to be used for painting paper-hangings are all those that can be used in water and varnish. But for common designs done with water only, the following are most proper.

For red, lake, vermilion, rose-pink, and red-ochre: for blue, Prussian blue, verditer, and indigo: for yellow, the yellow-berry wash, Dutch pink, and yellow ochre: for green, verdigris, or a mixture of the blue colours with the yellow colours, particularly with the yellow-berry wash: for orange, vermilion, or red lead, with Dutch pink: for purple, a wash made of logwood, or a mixture of the lake, or rose-pink, with deep coloured Prussian blue, or with indigo: for black, ivory black, and in some nicer cases lamp-black: for white, whiting: and for the heightnings, white-lead.

Where great brightness is required, the lake should be used for the crimson red, and Prussian blue for the blue; but for many purposes, rose-pink used alone for the crimson red, and indigo mixt with whiting for the blue, will answer the purpose with greatly less expence. The lake, rose-pink, Prussian blue, and Dutch pink, intended for this use, should be procured in a moist state.

The colours used in varnish may be the same as those used in water; but for this purpose, those just mentioned should be obtained dry.

As for the vehicles of the colours; when water is used, it must be inspissated with size and gum Arabic or Senegal. When burnish is used, it must be formed of oil of turpentine, and the resins and gums which will dissolve in that menstruum. With respect to the grounds for paper hanging, those that are laid in water are made by mixing whiting with the size above mentioned, and laying it on the paper, with a proper brush, in the most even manner. Nothing more is necessary, when the ground is to be left white; and the paper being hung on a proper frame, till it be dry, is fit to be painted. When coloured grounds are wanted, the same method must be pursued; and the ground of whiting first laid; except that, in paler colours, a second coating may sometimes be spared, by mixing some strong colour with the whiting. But where a greater force of colour is wanted, the pigment or colouring substance must be tempered with the proper vehicle, and then spread over the white coat. The varnish grounds are made much in the same manner, by mixing the proper colour with the varnish, and spreading it on the paper.

There are three methods by which paper-hangings are painted: the first by printing on the colours; the second by using the stencil; and the third by laying them on with a pencil, as in other kinds of painting.

When the colours are laid on by printing, the impression is made by wooden prints; which are cut in such manner, that the figure to be expressed is made to project from the surface, by cutting away all the other part. This, being charged with the colours tempered with their proper vehicle, by letting the print gently down on a block, on which the colour is previously spread, conveys it from thence to the ground of the paper, on which it is made to fall more forcibly by means of its weight, and the effort of the arm of the

person

PAPER.

person who uses the print. The manner of doing this, when more particularly explained, is thus.

The paper being properly prepared by a ground of whitening, colour, or varnish, is laid on a proper block, on which a piece of leather is strained. The colour, mixed with its proper vehicle, is spread on another piece of leather, or oil cloth, laid on a flat block, somewhat larger than the print; which is done by a boy or man who attends for that purpose; and having the colour by him, in a pot, spreads it with a brush on the block betwixt every stroke and impression the printer makes. The print is previously cut in such manner, correspondently to the design of the painting, that there shall be a projection on the surface answering to every part, where that colour intended to be conveyed by this print is necessary. The printer then takes the print either in his right hand, or, when too heavy to be so managed, in both, and drops it gently on the block, just charged with colour; from whence he again immediately raises it in the most perpendicular direction, and lets it fall in the strongest, though most even manner, he can, on the paper; increasing the force by all the additional velocity he can give the print. When this is done, the sheet printed is immediately taken off the block, and hung up to dry; and another being put in its place, the same operation is repeated, till the whole quantity of paper be printed. It is easy to conclude, that there must be as many separate prints, as there are colours to be printed; and they are to be used successively in the same manner as the first. But where there are more than one, great care must be taken, after the first, to let the print fall exactly in the same part of the paper, as that which went before: otherwise the figure of the design would be brought into irregularity and confusion. In common paper of low price, it is usual, therefore, to print only the outlines, and lay on the rest of the colours by stencilling; which both saves the expence of cutting more prints; and can be practised by common workmen, not requiring the great care and dexterity necessary to the using of prints.

The manner of stencilling the colours is this. The figure, which all the parts of any particular colour make in the design to be painted, is to be cut out, in a piece of thin leather, or oil cloth. These pieces of leather, or oil cloth, are called stencils; and being laid flat on the sheets of paper to be printed, spread on a table or floor, are to be rubbed over with the colour, properly tempered, by means of a large brush. The colour passing over the whole is consequently spread on those parts of the paper where the cloth or leather is cut away, and give the same effect as if laid on by a print. This is nevertheless only practicable, without great care, in parts where there are only detached masses, or spots of colours: for where there are small continued lines, or parts that run one into another, it is difficult to preserve the connection or continuity of the parts of the cloth, or to keep the smaller corners close down to the paper; and therefore, in such cases, prints are preferable. Stencilling is indeed a cheaper method of ridding coarse work than printing; but without such extraordinary attention and trouble, as render it equally difficult with printing, it is far less beautiful and exact in the effect. For the outline of the spots of colour want that sharpness and regularity that are given by prints; besides the frequent extralinations, or deviations from the just figure, which happen by the original misplacing of the stencils, or the shifting the place of them during the operation.

Pencilling is only used in the case of nicer work, such as the better imitations of the India paper. It is performed in the same manner as other paintings in water, or varnish.

VOL. XXVI.

It is sometimes used only to fill the outlines already formed by printing; where the price of the colour, or the exactness of the manner in which it is required to be laid on, render the stencilling or printing it less proper: at other times it is used for forming or delineating some parts of the design, where a spirit of freedom and variety, not to be had in printed outlines, are desired to be had in the work.

The manner of proceeding with these several methods is, in common work, to stencil first all parts of the colour in the design, and to give an outline to the whole at last, by printing with brown or black: but where there is any running part of the designs, such as scrolls, or the stems or stalks of creeping plants, or flowers, which are to be printed in any other colour than brown or black, a print must be used for them; though, if they require only brown or black, they may be done by the same print which makes the outlines.

In the finer paper, where several colours are laid on with the prints, the principal colour is begun with; and the rest taken successively; the print for the outline being laid on last. In cases where the pencil is to be used, the outline is nevertheless to be made before the colours are laid on by the pencil, if such outline is to be made at all; because that is the guide to the person who lays on the colour; and confines them to a correctness.

In paper printed with designs in chiaro-scuro, such as the imitation of stucco work, and bas-relievos, the order of printing must be, to lay on the ground colour first; afterwards the shades; and lastly the lights: and the same rule of succession must be observed where the colours are pencilled. *Handmaid to the Arts*, vol. ii. p. 445, &c.

Paper-hangings may be spangled with that kind of talc called isinglafs, which being reduced to a gross flaky powder, has a great resemblance to thin silver scales or powder. It is laid on by strewing over the varnish, which forms the ground, before it begins to dry. When it is laid on in a figure, for the representation of embroidery, the figure must be printed in varnish, and the talc strewed upon it, and treated like flock. Smalt may also be used in the same manner as flock or spangles. But hangings of this kind are now little used.

PAPER, ruled for the reception of musical characters. Rousseau was the first, we believe, who made this a lexicographical article. Five parallel lines form what musicians call the *staff*; upon which lines in the spaces are disposed all the notes of the time-table and their places in the general scale, regulated by clefs at the beginning of each staff.

All our music for keyed instruments, till the latter end of the seventeenth century, was written on staves of six lines, of which the lowest in the treble clef, and highest in the base, was the middle C of the general scale. See *STAFF*.

Almost all the music paper in Italy is ten-staved, for the convenience of scoring songs with four instrumental parts: as the violino primo, violino secondo, alto viola, voice part, and base. These being linked together by braces, are easily found, not only by the fingers, but by the instrumental performers, by whom they may be accompanied from the score.

The English have paper ruled on all forms and number of staves. In general, for violins, of 12 staves, and for the piano forte, and vocal parts, long quarto, as it is more on a level with the eyes, and conceals the visage of the performers less from the audience.

PAPER, among *Bankers*, and other negociants, is also used for bills of exchange, bank and promissory notes, &c.

Substituting paper for money, and giving the paper an arbitrary

arbitrary value, was the way of paying debts introduced in France by Mr. Law. A royal bank was established, to which people were to carry their money, and receive the value of it in bills, which were to pass current in trade as so much money. (Vide Cheygn. Scienc. des Perf. de la Cour, tom. ii. p. 292.) It was made confiscation of goods, and the gallies, for any man to keep above forty livres by him of any but paper money. When the regent was told what a rage was spirited up against him about the arrears of making paper current, and how openly the people threatened him, he answered coolly, the French were like watch-dogs, they would bark, but not bite: "Les François ressemblent aux chiens a garde, ils aboyent, mais ne mordent pas." Misc. Lett. tom. iv. p. 16.

PAPER-Books, in *Law*, are the issues in law, &c. upon special pleadings, made up by the clerk of the papers who is an officer for that purpose.

Upon an issue in law, it is termed the "Demurrer-book." The clerks of the papers of the court of king's bench, in all copies of pleas and paper-books made up by them, shall subscribe to such paper-books the names of the counsel who have signed such pleas, as well on behalf of the plaintiff as defendant: and in all paper-books delivered to the judges of the court, the names of the council who signed these pleas are to be subscribed to the books, by the clerks or attorneys who deliver the same. R. Pafch. Car. 2. 2 Lill. Abr. 268.

PAPER-Frames, in *Gardening*, are such as are formed with oiled paper, upon a slight frame-work of thin slips of wood. These frames are useful for several purposes in the early spring and summer season; such as in defending late hot-beds, and sometimes in particular natural ground beds of curious tender plants, seeds, cuttings, &c.

When formed as above, they are made, either in a ridge manner, with two sloping sides, longways, or arch-fashion, in dimensions from five to ten feet in length, and three to four in width, and two to three feet in perpendicular height; the wood-work is covered with large sheets of strong white paper, pasted on securely, and, when dry, brushed over regularly with linseed oil, to resist and shoot off the falling wet of rains and dews, and to render them more pellucid, so as to admit the rays of light, and the heat of the sun, in a proper degree. When thus prepared, and perfectly dry, they are ready for placing over the beds for the purposes required; in which the paper continues durable generally only one season; but the frame-work will last several years, by being fresh papered.

These kinds of temporary frames are also useful in some of the hand-glass crops of melons, and occasionally in those of cucumbers, but more generally in the former; which after having advanced in growth, to fill and extend beyond the compass of the hand-glasses, they should be removed, and the paper-frames placed over the bed, covering it wholly in width and length, the runners of the plants being trained out regularly along the surface; continuing them constantly over the plants, which are thereby protected from external injuries, and inclement weather, either cold or excessive rains, winds, &c. likewise from the too powerful heat of the sun. See *CUCUMIS Melo*.

They may also be used for late hot-bed cucumbers, when in want of garden-frames or hand-glasses for the purpose, being placed over the bed, at once finally to remain: and with proper care in giving occasional air, water, and covering over the frames with mats in cold nights, and very hard rains, &c. cucumbers may be raised in a tolerable manner.

They may likewise be employed occasionally, in default of others, in the raising moit of the less hardy or tenderer

annuals, both in sowing them into hot-beds, and warm borders of natural earth.

Paper-frames may likewise be used advantageously in pricking out many sorts of small tender seedling plants in the hot summer months, to defend them from casual unfavourable night air, heavy rains, &c. and afford a fine growing shade from the hot rays of the mid-day sun. The same kind of frames may still further be beneficial in raising many sorts of tender exotics, from small cuttings and slips in summer, both of the woody, herbaceous, and succulent kinds, either planted in hot-beds, or in the natural earth, as the different kinds may require: which being covered close with them, they exclude the outward air, admit the light and influence of the sun in a proper degree, and at the same time afford a peculiar kindly shade.

These frames are chiefly made in the forms mentioned above, in an open manner, having the ribs or spars twelve inches asunder, first forming a bottom frame, rather stronger than the other parts, with a ridge-piece supported at a proper height, extending longways in the middle; then narrow side rafters, arranged from the bottom to the ridge-rail at top, a foot distant, both for the advantage of pasting the paper regularly, and to admit a proper degree of light between them through the paper: but when of great length, it is proper to have one or two pannels on one side, eighteen inches or two feet in width, to open outward with hinges, convenient for admitting air, and performing other occasional culture: the whole being thus formed in the wood-work, it is then proper to extend lines of packthread cross-ways of the ribs, going round each, level or even with the upper surface of the frame, continuing two or three rows a foot asunder, from the lower part upward, drawing other lines, crossing and intersecting these at the same distance, regularly between the ribs of the frame-work; which arrangement of the lines is of essential service for the more effectual support of the paper when pasted on the frame, and strengthening it against the power of winds and heavy rains. The paper for this use should be of the larger strong printing or demy kind; which, previously to pasting on the frame, should be moderately damped with water, that it may not sink in hollows after being fixed; and as soon as thus prepared, it should be pasted on, sheet and sheet, in a regular manner, one large sheet and a half, or two at most, generally ranging from the bottom to top, contriving to have whole ones along the ridge-rails above, extending lengthways and across, placed conveniently to join regularly with the other sheets below; and if, at the intersections of the packthreads, a small square or round bit of the same paper be pasted on the inside to the main sheets over that part of the packthread, it will give it additional strength against rain and wind. And, when the paper is thus pasted on, and perfectly dry, it must be oiled over with linseed oil, either raw or boiled; the latter is, however, rather apt to harden the paper, and more liable to crack or break; it may be applied by means of a painter's soft clean brush, dipping lightly, and brushing the outside of the paper all over, equally in every part; then placing the frame in some dry covered shed, to remain till the whole is thoroughly dry; when it may be used.

But though these sorts of frames may be cheap, and answer many little purposes of the gardener, they are not by any means so useful as those made with glass in the usual manner.

PAPER-Mills, (in the court of king's bench) is where the writings belonging to that court are repositd.

PAPER-Money, *Currency*, or *Credit*, as they are indifferently called, in *Political Economy*, is a subject of great importance - and

PAPER CURRENCY.

and no small difficulty. The different and opposite opinions which have been entertained respecting its nature, operation, and advantages and disadvantages, arise, partly from a want of regular and clear reference, in discussing this subject, to the undisputed and fundamental principles of political economy, and partly from not attending to that particular branch of this science to which this subject more especially and closely belongs.

If we examine what the most celebrated and judicious authors have written respecting paper money, we shall find that scarcely any of them have adverted with sufficient precision, and in a sufficiently decided and distinct manner, to the points of difference which exist between paper money issued by government, and which it is rendered obligatory upon the people to receive, and that species of paper money which consists in the notes of bankers, payable to the bearer on demand, and which pass current for the sums specified in them. Of the former kind were the assignats and mandats issued by the government of France during the first years of the Revolution; the paper money issued in America, before and during the war with this country; that which was issued by the Dutch during their long and arduous struggle for independence; and, generally speaking, the paper money which most of the governments on the continent of Europe have found themselves compelled to issue during the French Revolutionary wars. It will be sufficiently evident, from the slightest consideration of these two species of paper money, that they differ completely and essentially in their nature, and that we shall be led far astray from the truth in our discussions on paper currency, if we infer, from what has taken place respecting the one species, what will probably, or must necessarily take place respecting the other species.

In order that in this article we may not be led into any confusion of these two species, it may be proper, before we proceed, to consider the nature, effects, and advantages and disadvantages of bank paper, properly and strictly so called, briefly to discuss the subject of government paper. In general the paper issued by the governments on the continent of Europe, contains no promise to pay either on demand, or at the termination of a limited and specific period; it is, in reality, nothing more than paper stamped with the amount of the sum for which it is to pass current, and with such marks or signatures, as may serve to distinguish what is genuine from what is forged. Here, then, we at once perceive an essential difference between government paper and bank paper: the former is in fact, strictly speaking, *paper money*; or, in other words, paper issued as money instead of the precious metals; the latter, as we shall shew more clearly and fully afterwards, is not, strictly speaking, paper money, though thus denominated in general and popular language, but a written obligation to pay a certain sum of money on demand. Another striking and essential difference between these two species of currency arises from the distinction just pointed out: it is plain, that if the written obligation to pay on demand is given by persons who are of undisputed and established credit, few will be disposed to refuse such written obligation, and therefore this species of paper currency will be received without compulsion, and where the credit of the issuer or issuers is undoubted, equally as metallic money. But the reverse must be the case with regard to government paper money: it contains no obligation to pay metallic money, and therefore will never be preferred to the latter, or taken, unless in cases where there is no alternative. With respect to bank paper, it is sought after; the taking of it is a matter of choice: with regard to government paper, it is compulsory on the people; the government which issues it, tenders it in payment of the debts which it may have contracted, and it

is taken, only because, if it is refused, no other payment will be made. It may, however, be remarked, that another cause operates, in some degree, towards the acceptance and circulation of compulsory government paper; for though this paper contains no obligation or promise to pay in metallic currency, yet as all governments necessarily receive large sums from their subjects in taxes, the unwillingness of the people to receive this compulsory money, is in some measure removed, by the conviction that part of it will be taken back by government in payment of taxes. It will be no difficult matter to perceive what, in almost every case, must be the consequence of an issue of compulsory government paper: as long as any government confines itself to a metallic currency, there is some check to the extravagance and carelessness of its expenditure; for if it be extravagant or careless, it will experience great difficulty in replacing the money it has thus expended; but, on the other hand, if it substitute compulsory paper money in the room of a metallic currency, there can be no check to its carelessness or extravagance, except what arises from the necessary consequence of an excessive issue of paper money.

This consequence it may be proper to consider somewhat at large, since, though all authors are agreed, that an over-issue, and consequent depreciation of compulsory government paper may take place, and, in fact, has almost uniformly occurred, yet great difference of opinion exists, whether, in the case of bank paper, an over-issue and consequent depreciation can possibly occur. In order to keep quite separate and distinct the question of the depreciation of government paper currency, as it arises from a diminution of confidence in the stability of the government which issues it, it will be proper to consider this point; on the supposition, that the confidence of the people in the stability of their government remains the same, during the whole course of the increasing issues of its paper currency; and to confine ourselves solely to the investigation of the consequence produced by an increased issue, and of the mode in which this consequence is produced.

Money, of whatever it is composed, whether of metal or paper, like every other commodity, depends, for its value, on the proportion between it and the commodities for which it is exchanged: if this proportion is altered or deranged, the value of the money will be altered: if, while the quantity of money remains the same, the quantity of the commodities is diminished, the money must necessarily bear a larger proportion to them than it previously did; and consequently, its power to purchase them will be diminished: strictly speaking, however, this cannot, with propriety and precision of language, be denominated a depreciation of the currency, as the variation in its value or power of purchase, arises entirely from a change in the quantity of commodities, and not, in the smallest degree, from any alteration in the quantity of the currency. But if, while the quantity of commodities continues stationary, the amount of the circulating medium is increased, the consequence already pointed out will equally ensue; that is, the power of the currency to purchase commodities will be diminished; and the currency, therefore, so far as it is considered in relation to commodities, will be depreciated. But in all countries where a compulsory government paper is issued, the metals, even when coined, soon are regarded solely as commodities, and are affected, equally with all other commodities, by the increased issue of the paper currency. As, therefore, there is no check to the issue of government paper, and extravagant or careless expenditure calls for increased issue, a depreciation of such paper necessarily ensues; and each stage in the depreciation occasions a further issue, which in its turn in-

PAPER CURRENCY.

creates the depreciation; for when the government perceives that one thousand pounds in paper money, for instance, will no longer command the same quantity of the commodities which it needs, that it would formerly do, but that one thousand and fifty pounds are requisite for this purpose, it is compelled to increase its issue of paper money in this proportion, and this increased issue, again raising the price of commodities, requires a still larger issue, the next time that the government has occasion to make a purchase.

Hitherto we have considered the question of the depreciation of compulsory government paper as arising solely from the circumstance of an increase in the quantity issued: but other causes are operating, at the same time, and towards the production of the same effect; for no compulsory government paper can possess the confidence of the people, (and *value* or *confidence* are absolutely necessary to the character and uses of money,) if that character is to be preserved inviolate, and those uses are to be obtained and preserved in their full and complete effect. On the first issue of compulsory government paper, it is received with reluctance: metallic money is preferred to it, and where it can be procured, a premium is willingly given for it, or, in other words, the compulsory government paper is at a discount. But, if this is the case at the first issue of it, and when the amount is comparatively small, we may easily conceive what will be the consequence, if a larger and constantly increasing quantity is forced on the people: this increasing quantity must act, not only in the manner which we have already described, towards its own depreciation, by the same process in which all commodities are depreciated by increase, but it will also operate towards its own depreciation in another manner. The very first issue of a compulsory government paper is a sufficient proof of an impoverished and embarrassed government; and every future issue, especially if the amount of the issue be increased, is a proof that the poverty and embarrassment of the government are increasing: but it is utterly impossible, that while the poverty and embarrassment of a government are increasing, the confidence which the people repose in it can remain stationary: it must diminish, and a diminution of public confidence in a government displays itself in no respect so unequivocally and materially, as in the estimate which is formed of the value of the paper currency. Here, then, we perceive the real and full state of the case, whenever a government increases the issue of its compulsory paper: a larger quantity of a currency, on its first circulation received with reluctance, and only because no other mode of payment could be obtained, is issued; the increased issue, of itself, would necessarily diminish the value of the currency, but this consequence is increased by the suspicion which such a measure on the part of government creates, that the finances of government are on the decline; hence, from the operation of both these causes, *viz.* an increased issue, and diminished confidence, a depreciation of the compulsory government paper must necessarily ensue.

There is still another subject incidentally connected with paper currency, on which it may be proper to say a few words, before we proceed to the immediate topic of this article. By many, bills of exchange, or exchequer bills, payable only at a certain time, and bearing interest, are considered as paper currency; and it is contended that an increase in the issue of them has exactly the same effect as an increase in the issue of government or bank paper. This notion, though certainly plausible, and maintained by writers of considerable acuteness and knowledge on the subject of political economy, a little reflection will serve to convince us is erroneous and unfounded. We have only to reflect on the nature and operations of currency, to be convinced

that bills of exchange and exchequer bills do not form a part of it; and, indeed, that notes *bearing interest*, are by that very circumstance excluded from the character and operations of currency; and that the increased issue of these, so far from tending to depreciate the value of money, must rather operate to raise it. Under the article MONEY we endeavoured to shew that the mere increase or diminution of the circulating medium did not necessarily tend to lower or raise the rate of interest: but that the rate of interest must depend on the quantity of money offered to be lent, and on the number of the borrowers, and the terms which they were willing and able to give: so that if the increased quantity of money thrown into the market was entirely employed in the purchase of commodities, and not offered to be lent, the rate of interest would not be affected, in the smallest degree, by this increased quantity: while, on the other hand, if the quantity of money in circulation continued the same, but part of it was withdrawn from the purchase of commodities, and offered to be lent, the rate of interest would fall. The same train of reasoning which serves to establish these facts, will conduct us to a proper consideration of the nature and operation of bills of exchange and exchequer bills. They are brought into the market, not for the purpose of employing them in the purchase of commodities, but for the purpose of sale; and they are generally bought by those who wish to put out their money to interest: hence they may operate on the rate of interest, but they cannot operate on the price of commodities, unless it be, as has been already stated, to lower the price of commodities, or, in other words, to raise the value of money. That they may have this effect will appear from the following considerations: let us suppose that the money and commodities in any market bear a certain proportion to one another, and that this proportion is disturbed, by the introduction, either of a greater quantity of some of the commodities formerly in the market, or by the introduction of some new commodity; it is plain that in either case, if the quantity of money continue the same, that its value or power of purchase will be increased, since it will now exchange, not merely for the commodities formerly in the market, but also, in addition, for the increased quantity of the old commodities, or for the new commodities. If, instead of a new commodity properly so called, we suppose that a person comes into the market, wishing to borrow money, and offering such a rate of interest, as secures to him part of that money which used to be expended in the purchase of commodities; in this case also, the value of the money, or its power to purchase must be increased, since it will now command, not only the commodities it formerly did, but also the interest offered for the sum wished to be borrowed. But in this question, it is a matter of mere indifference in what manner the interest to be paid is promised or secured; whether in the usual way, or by bills of exchange, or by exchequer bills. The general fact and consequence are precisely the same in all cases: if bills of exchange or exchequer bills are brought into the market, they are brought, not to purchase commodities with, but for sale; and if they are sold, for part of that money which used to be expended in the purchase of commodities, it is evident that the price of these commodities must be lowered, not raised, by the introduction of these bills of exchange, or exchequer bills; and consequently, that as their nature and operation is that of commodities, not of circulating medium, their issue cannot lower the value of money, but must, in some degree, tend to raise it.

Having thus cleared the way for the uninterrupted consideration of the more immediate and proper subject of this article, we shall arrange the remarks which we mean to offer

PAPER CURRENCY.

under the following heads: 1. The real nature of bank notes. 2. The effects of this species of currency. 3. Its advantages and disadvantages, as compared with a metallic currency. 4. The nature and process of the checks to the over-issue of bank paper, when it is payable on demand: and, 5. The state of bank paper, when not payable on demand, so far as regards its over-issue, and its supposed depreciation, arising from this or other causes.

1. Bank notes have very generally, but very erroneously and improperly, been denominated the representatives or symbols of coin. This is one, among many other instances of vagueness and confusion of ideas, arising from the injudicious and careless use of metaphorical language, which has so much retarded the advance of the science of political economy. What precise or clear idea can we attach to the terms representative of coin? or how can bank notes be so denominated? It has been justly remarked, "that the most accurate representatives of coin, are well fabricated counterfeits, yet every man, when he knows them, refuses these in payment." Indeed it is not easy to perceive how this language came to be adopted, or where was the necessity or temptation to have recourse to metaphorical language, to express a fact sufficiently obvious, clear, and undoubted. A bank note does not represent coin; nor is it circulated and received on that account; but it is an obligation on the part of the person or persons who issue it to pay, on demand, a certain quantity of gold or silver. "A common cheque upon a banker, which nobody ever dreamed of calling a representative of money, is just as much a representative of it as bank notes; nay, in fact, the order which the manufacturer, on the Saturday night, puts into the hands of one of his workmen, to get from his clerk the wages of the week, is a representative exactly of the same description. The only real difference in practice is, that the one obligation generally passes but through one or a few hands, till it comes upon the obligee: the other passes through many hands, each accepting it as a satisfactory security for the valuable commodity which it is an order to receive."

Having thus, it is presumed, refuted, perhaps at the expence of more words than it deserved, the notion, that bank paper is a representative of coin, the next topic of enquiry under this head, is what, in fact, does the person who issues the note oblige himself by such issue, and by the terms of the note, to pay on demand. This enquiry may, at first sight, appear as little necessary as the previous investigation, since the obligation on the note is clear and distinct: there is no vagueness or ambiguity about it, and, indeed, if there were, the value of the note would be in a great measure, if not entirely, destroyed. It is only of late years, that any question or doubt has been started respecting the nature of the obligation expressed on a bank note; and the strange and almost unintelligible opinion which has been broached on the subject, forming part, as it does, of the doctrine of abstract currency, scarcely deserves notice here, especially as this doctrine has been already canvassed under the article MONEY. A few words, however, may be spent to state this opinion; and it is believed an impartial statement of it, if it can be made intelligible, will render almost unnecessary any formal and direct refutation of it.

The leading principle of those who hold this opinion is, that the pound sterling is an imaginary or abstract portion of the currency, and not any thing tangible or substantial: hence they infer, that as the bank note promises to pay one, five, or any given number of pounds sterling, the obligation laid on the issuer, is not to pay any precise and real sum, nor can the note be said to be depreciated, if it does not pass current for the value of the metal expressed on it. In

support of this opinion no argument is advanced; no reference to general, undisputed principles is made; it is left to struggle, arbitrary and absurd as it is, relying solely on the hardy and reiterated assertions of its defenders: they forget that though there is no coin called a pound sterling, the value of a pound is known and acknowledged both by the laws and by common consent; that their doctrine is totally inapplicable to notes such as those common in Scotland, which promise the payment of a guinea, an existing and known coin; and that while the notes of the bank of England were payable on demand, their opinion was neither acted upon by the bank, nor entertained by themselves.

2. With regard to the effects of paper money, they may be considered under two heads: the effect it produces on the price of commodities, and the effect it produces on the metallic currency along with which it circulates. Mr. Hume entertained the notion that paper money raises prices, whereas Dr. Adam Smith, referring to what he considers as a general fact in the theory of circulation, that every addition of paper to the currency displaces an equivalent quantity of gold, holds an opposite opinion. This notion of Smith, however, must be received with some limitation: if by an addition of paper to the currency in any country, the price of any commodity is raised in that country so high, as will pay for its importation, it will be imported, and part of the metallic currency will probably be employed to pay for the commodity thus imported. But whenever the addition made to the currency by paper money is employed in the production of commodities, and the increase in the quantity of these commodities is in the same proportion as the increase to the currency, by the addition of paper money, there will be no reason for exporting gold, and the whole currency, consisting of the precious metals, and of paper, will be no more than is necessary to circulate the increased quantity of commodities in the market. In considering this branch of the subject in a more extended sense, it will be necessary to look to the effect produced on the value of the precious metals, in the general market of the world, by the addition of paper to the currency of any particular country, in cases where that addition, not producing a corresponding increase in the quantity of commodities, enhances their price, and thus leads to the exportation of gold from the country where the paper currency is issued. In these cases, "the same exportation of gold, which remedies the temporary rise that takes place in the particular country where paper has been issued, has a tendency to increase the supply of precious metal in the general market of the world, and thus to occasion a general rise of prices in which that particular country must participate. The whole quantity of bullion, of which Great Britain has spared the use by adopting a different medium of domestic exchange, is added to the general stock of the mercantile commonwealth, as much as if an equal quantity had been brought additionally from America; and the saving of that annual loss which would have been occasioned by the waste of British coin, is equivalent to an increase in the annual produce of the mines."

The above remarks display considerable command of the subject, and are worthy of that author, who by his analysis of, and observations on, "Thornton on the Paper Credit of Great Britain," contributed so materially to bring the Edinburgh Review into notice; we are, therefore, the more surprised that in the remark immediately following the passage which we have just quoted, he should have so completely misunderstood the subject and contradicted himself: we allude to the following observations. "But, on the other hand, it must be remembered that the use of paper money tends, in some degree, to *lower* the price of commodities. In proportion

PAPER CURRENCY.

tion as the instruments of commerce, or the machinery of manufactures are of a less expensive construction, the articles which they contribute to produce may be afforded at a lower rate. To employ paper money instead of gold, is to substitute a very cheap instrument of commerce in the room of a very expensive one." Now the inference to be drawn from the circumstance here alluded to, appears to us directly the reverse; when any saving of labour or expence takes place in the production or manufacture of any commodity, that commodity, costing less, can be sold at a lower rate, with an equal profit to the seller: in like manner, when paper, a very cheap instrument of commerce, is employed in the stead of gold or silver, very expensive ones, more paper money can be afforded in exchange for the same quantity of any commodity than could have been afforded of metallic money: but in this case certainly the price of the commodity is not *lowered*, but raised, since for it more money is now given than was formerly given.

On the whole, with respect to the effect of a paper currency on the price of commodities, and on the precious metals with which it circulates, it may be remarked, that it must vary according to the circumstances under which the paper currency is emitted, and the quantity which is thrown into the market: and these variations in its effects will more properly be considered under the next head, *viz.* the advantages and disadvantages of a paper currency, as compared with a metallic currency.

The first advantage resulting from the use of a paper currency, which occurs to the observation of a person reflecting ever so superficially on the subject, is, that by the substitution of paper in the room of gold and silver money, a very expensive instrument of commerce is replaced by one much less costly. So far the substitution of paper money must be advantageous to the community; the currency of a country is a part of its capital, which may be considered as unproductive; it is, indeed, necessary to carry on the operations of its commerce, but it does not, strictly speaking, increase that commerce; it is, therefore, of the utmost importance, that this instrument, thus unproductive, should be procured and kept in action, with the least possible expence. But where gold and silver alone are employed as the currency of a country, they must either be obtained directly from the mines at great labour or expence, or purchased by commodities on which the same quantity of labour and expence has been laid out. Again, if in a country, the currency of which consisted entirely or principally of gold and silver, a paper currency is introduced, it is evident that a part of its former metallic currency will be set at liberty, and may be expended in the purchase of foreign commodities. Paper currency, as we have already shewn, is in fact only an obligation to pay on demand a specific sum of gold and silver; it therefore might be inferred that the substitution of paper for gold and silver would not set at liberty any portion of the latter, since it would be necessary to retain the whole, in order to answer the demand of those who brought the paper currency for payment. But the fact is, that a comparatively small proportion of gold and silver is required to answer the demands occasioned by a very extensive paper circulation; those who issue bank notes soon ascertain, with sufficient and perfectly secure precision, the exact amount of gold and silver, which it is necessary or prudent to keep by them, and the rest is employed in the purposes of commerce.

Whatever evils may have resulted from an injudicious and superabundant issue of paper money, there can be little doubt that this species of currency has been of great service in increasing the produce and extending the commerce of the country. Let us suppose an instance of common occur-

rence, and of no intricacy or complication in its detail: a gentleman possesses a large estate, that is in a great measure in an uncultivated and unproductive state: he does not possess the capital adequate to the full improvement of it; and yet there can be no doubt, that if sufficient capital were laid out upon it, in a judicious and skilful manner, not only the owner, but the community, would be greatly benefited. In a country destitute of paper currency, he would experience great, perhaps insurmountable difficulties, in borrowing the requisite capital; whereas, in a country possessed of a paper currency, the means of improvement would be easily obtained, and a great increase of produce, and consequently of wealth, would be added to the public stock. Whoever has watched the progressive improvement of Great Britain, not only in the extended and superior cultivation of her soil, but in the increase of her manufactures and commerce, must be convinced that the rapid and great advances she has made in wealth within these few years, have been in a great measure owing to her paper currency.

The following passage from Smith's *Wealth of Nations* will set the advantages of a paper currency, perhaps, in a still clearer light. "It is not by augmenting the capital of the country, but by rendering a greater part of that capital active and productive than would otherwise be so, that the most judicious operations of banking can increase the industry of the country. That part of his capital which a dealer is obliged to keep by him unemployed, and in ready money for answering occasional demands, is so much dead stock, which, so long as it remains in this situation, produces nothing, either to him or to his country. The judicious operations of banking enable him to convert this dead stock into active and productive stock; into materials to work upon, into tools to work with, and into provisions and subsistence to work for; into stock which produces something, both to himself and his country. The gold and silver money which circulates in any country, and by means of which the produce of its land and labour is annually circulated and distributed to the proper consumers, is, in the same manner as the ready money of the dealer, all dead stock. It is a very valuable part of the capital of the country, which produces nothing to the country. The judicious operations of banking, by substituting paper in the room of a great part of this gold and silver, enable the country to convert a great part of this dead stock into active and productive stock; into stock which produces something to the country. The gold and silver money which circulates in any country may very properly be compared to a highway, which, while it circulates and carries to market all the corn and grain of the country, produces itself not a single pile of either. The judicious operations of banking, by providing, if it may be allowed so violent a metaphor, a sort of waggon-way through the air, enable the country to convert, as it were, a great part of its highways into pastures and corn-fields, and thereby to increase very considerably the annual produce of its land and labour. The commerce and industry of the country, however, it must be acknowledged, though they may be somewhat augmented, cannot be altogether so secure, when they are thus, as it were, suspended upon the Dædalian wings of paper money, as when they travel about upon the solid ground of gold and silver. Over and above the accidents to which they are exposed from the unskilfulness of the conductors of paper money, they are liable to several others, from which no prudence or skill of those conductors can guard them."

The disadvantages and evils of paper money, indeed, arise from the same causes which produce its advantages and benefits: we must never forget, that the foundation of paper money

PAPER CURRENCY.

money is credit; that it is, in fact, an obligation to pay on demand a certain sum of metallic currency. Credit does not create capital, it only sets that portion of capital in operation, which would otherwise be inactive: the person who gives credit, in reality gives part of his capital, which he has not the disposition or the means to employ: and the person who receives credit or capital, by employing his industry and skill along with his borrowed capital, is enabled to repay it, and the stipulated interest. So long as the credit of the lender is good, and the repayment of the borrower punctual or undoubted, so long a paper currency thus established, if not pushed too far, must be beneficial to the lender, the borrower, and the nation at large. But let us suppose that from any cause, confidence in the paper money of a country was destroyed or shaken, and we shall immediately perceive the disadvantages and evils of this species of currency, as compared with a metallic currency. Where the commercial transactions of a country are entirely carried on in a metallic currency, opinion has no room for operation: no confidence is reposed; commodities are sold, not for what may or may not be worth the value which they represent or promise, but for what possesses absolute and intrinsic value. No circumstance will point out and exemplify the difference between a paper and a metallic currency so clearly and strikingly, as the invasion, or dread of invasion, in the countries in which they respectively exist. If a country, the currency of which consisted principally or entirely of paper, were actually invaded, or threatened with invasion; or even, if its internal state were convulsed or disturbed, or its finances considerably disarranged, its paper currency would be immediately affected: its value would fall, in proportion as the confidence reposed in it was diminished: people would prefer metallic currency for this strong and obvious reason, that whoever had possession of the country, whatever change took place in its government, or into whatever circumstances of political or financial embarrassment and confusion it was thrown, the value of the metallic currency would remain unchanged, whereas the value of the paper currency would be subject to constant variation, and might probably be totally destroyed.

It is sometimes objected to a paper currency, that by exchanging commodities for it, we in fact get nothing valuable, whereas when we sell our commodities for gold or silver, we obtain something of real and intrinsic value: but this observation amounts to nothing, provided the credit of the paper currency be good; it is, indeed, founded on the erroneous idea, that when we sell our commodities, we look for any thing else in the money which we receive, but the certainty that it will be taken from us at an undiminished value. When a person sells a quarter of wheat for five pounds, it must be a matter of perfect indifference to him, whether he receives five pounds in silver, or five pounds in paper, provided he is convinced that in the purchase of what he may want, the latter will go as far as the former: in selling his wheat he is never disturbed by the idea, that five pounds in silver have intrinsic value, *i. e.* value as metal, while the five pounds in paper possess no intrinsic value; the power each possesses over commodities is all he regards, and if that power be equal, their value, for all the purposes he needs them for, is equal in his estimation.

It has also been objected to paper currency, that its use is solely confined to transactions of domestic traffic; and consequently that a country, which has no other species of currency, must go to a foreign market to purchase commodities at a great disadvantage; the fact is undoubted, that, generally speaking, a paper currency is without value in a foreign country, but the inference by no means follows, that

on this account foreign commodities must be purchased by a country which possesses only a paper currency, at a great disadvantage. On the first establishment of a paper currency, the very reverse must be the case; or to speak more correctly, the establishment of a paper currency setting loose a portion of the metallic currency, this may be employed in purchasing a larger quantity of foreign commodities, than the country could afford to purchase, while this metallic currency was necessary for the circulation of its internal commerce. But, even after a paper currency is established, foreign commodities may be purchased at an equally cheap rate, as they were while the currency was metallic; for in the first place, foreign commodities are seldom purchased by the coin of the country purchasing, but either by bullion, or the interchange of commodities; and secondly, while a bank note for a guinea will exchange for a guinea, it will always command, indirectly, the same quantity of foreign commodities, as could be purchased, if the currency were entirely metallic.

But the objection to paper currency, urged most frequently, and with the most confidence in its appositeness and solidity, arises from the extreme facility with which it may be increased; the strong temptations to increase it, and the evils to the community, to which an improper increase must give rise. The consideration of this objection naturally leads us to the fourth head of our disquisition, *viz.* the nature and process of the checks to the over-issue of bank paper, when it is payable on demand.

It may be proper first to consider what is meant by an over-issue of paper money: the term is too often used without any clear and definite idea being attached to it. When the quantity of circulating medium, whether metallic, or of paper, is increased in a country, the increase either operates to the production of a great quantity of commodities, that is, is usefully employed, or it merely operates to raise the prices of the commodities already in existence: before, therefore, the addition of any sum to the circulating medium can be said to be an over-issue or not, the effects produced by it must be traced and ascertained: if a correspondent addition to the quantity of commodities has taken place, there cannot be said to be an over-issue of currency; but if no such correspondent addition has taken place, as the sum added to the currency cannot be inactive or unapplied, a rise of price must take place, and then an over-issue may justly be said to have occurred. Those who sell as well as buy, probably will not be much or long injured by this rise, since any addition to the currency is not long in adjusting itself to the various commodities in the market, and consequently, if some commodities are bought dearer, other commodities are also sold dearer: but those persons, whose whole property consists in money, are injured, when there is an over-issue of the currency; *i. e.* when an addition to the currency does not produce a correspondent addition to the commodities in the market. While the currency is entirely metallic, they are in a great measure guarded from a sudden or violent over-issue, and consequently, from a sudden or violent rise of prices, or depreciation of money, their sole property; since before any great addition can be made to the circulating medium, additional labour must have been bestowed on the mines. But where paper currency is established, the case at first sight seems different; the value of their property, *i. e.* money, is at the mercy of all who can issue bank notes: if, however, we investigate what actually takes place, where there is a paper currency payable on demand, we shall find that the property of the monied man is guarded as effectually, though not so directly, as if the currency were metallic. Let us suppose a large addition to be made to the paper currency of any particular district in this country;

country; this addition operates either to the rise of prices solely, or to the increase in the quantity of commodities; in the latter case, the monied man has no cause to complain; there is indeed more money in his neighbourhood, but as there are also more goods, the value of his money is not affected. On the other supposition, that the increase to the paper currency raises the price of commodities, let us see what will occur: those commodities, the price of which is raised, will be purchased in another district, where they have not undergone a similar rise; but before they can be purchased, the local notes must be exchanged for such as are current in the district where the purchase is to be made; or, in other words, some part of the over-issued notes will return to the bank which issued them. This will be a sufficient proof and warning to the bank, that they have issued more notes than the commercial transactions of the district required, and as on notes almost immediately returned, the expence in manufacturing them, and their proportion of the establishment must far exceed the profit made on them while they were in circulation, the bank will be careful in future not to over-issue their notes.

A process similar in all its steps, and in its result, will take place, if the bank of England, while subject to be called upon for cash payments, should over-issue their notes: the over-issued notes will either spread themselves over the country, for the purchase of such commodities as have become cheaper in the country than in London, by the addition to the circulating medium, or they will be returned to the bank of England for gold, wherewith to go to a foreign market.

Thus it would appear that the property of the monied man is rather more secure, and better protected from depreciation, in a country, the currency of which consists of paper payable on demand, than in a country, the currency of which is entirely metallic; since, in the former country, the real and well understood interest of those who issue the paper money must lead them most carefully to avoid any over-issue; whereas in a country, the currency of which is entirely metallic, though no addition to it, sufficient to raise the prices, can long remain in it, yet it may both remain longer, than an over-issue of paper money, and be repeated more frequently.

We now come to the last head, *viz.* the state of bank paper, when not payable on demand, so far as regards its over-issue, and its supposed depreciation arising from this or other causes.

The suspension of cash payments in the bank of England, in the beginning of the year 1797, forms a most memorable era in the history of the science of political economy; and the undiminished confidence which after this measure was, and is reposed in the bank of England notes, has shaken to the foundation many favourite theories in this most intricate and delicate science. By some it is alleged, that the confidence in bank of England paper remained the same, even after the suspension of cash payments, because there was a general and well-founded belief, that the bank was able to pay all its notes in specie; but something more than mere ability would seem necessary to inspire or continue confidence. Of what moment is it to the holder of a bank of England note, to be told that the bank can pay it in specie, if he knows that they will not, and that he cannot compel them? By others it was argued, that the confidence was still continued, because it was expected, that in a short time cash payments would be resumed; this consideration might have operated on some persons, at the time of the imposing the restriction, but now it can have no weight, as the expectation that cash payments will soon be resumed, must be

utterly banished from the mind of every man; and yet no diminution of confidence has taken place. The continued confidence, without diminution, in the bank of England paper, after they were relieved from the obligation to pay in cash, seems to have arisen from the following circumstances; all the principal merchants, and government itself, declared their willingness to receive bank paper as before; the mass of the nation were content with this, for, as has been remarked under the article MONEY, though intrinsic value is indispensibly necessary, at first to give circulation, yet, in process of time, that circumstance is never adverted to, except by those whose business it is to watch the variations in the value of the metals of which the money is formed. The nation at large knew, that the bank would no longer pay in cash, but they also knew, that bank of England paper, though thus deprived of its intrinsic value, would be received the same as before by all those to whom their principal or most common payments were to be made: as, therefore, the bank of England paper still retained the character and uses of money, the alteration in its intrinsic value was not adverted to.

With respect to the danger of over-issue, when cash payments are suspended, it is argued, that it is merely chimerical; since no one will pay interest to the bank for money, from which he does not expect to derive more profit than the interest he pays; and consequently, as all issues are made for commercial purposes, they will not be carried to a greater extent than the state of commerce requires. But it may be very true, that there are no issues, but what the state of commerce requires, and what will produce, or are expected to produce a profit to the borrower; and yet there may be an over-issue of bank paper; or, in other words, an issue, that will raise the price of commodities; since, in many instances, the profit expected by the borrower, may arise from this increase of prices. Let us suppose a merchant wishes to buy largely cotton, corn, or any other commodity, and for this purpose gets his bills discounted at the bank of England: his speculations succeed, and he makes a large profit; in this case, the price of the cotton or corn is necessarily increased by the greater sum brought into the market for the purchase of it, by means of the discount afforded by the bank of England: there is a real commercial transaction; and yet, as there is no increase in the quantity of commodities, but a mere transfer, the bank notes issued for this purpose ought to be considered an over-issue, that is prejudicial to the property of the monied man, though advantageous to the bank and the merchant.

It is evident that paper money, when not payable in cash on demand, must be more liable to depreciation from any doubt respecting the security of the country, than if it could be converted into cash at pleasure; but how far it is liable to depreciation from other causes, is a question on which there is much difference of opinion. If, as we have endeavoured to shew, there may be an over-issue, *i. e.* such an issue as will raise the price of commodities, the price of gold and silver bullion must rise as well as all other commodities; but when the bullion price of the metals rises above the mint price, the coin will soon be regarded only as a commodity, and will in spite of all laws and penalties be bought and sold as such. When a difference in the estimated value of paper currency and metallic currency takes place, from whatever causes it may arise, one of two effects must follow; either the paper currency and the metallic currency will be equally current, each at its respective value; or the metallic currency, being regarded solely as a commodity, will disappear. Where depreciation has occurred from want of confidence, it has generally happened, that the paper and metallic

metallic currency have circulated together, each at its own value; but where depreciation has taken place, from an increase in the quantity of paper, from a diminution in the quantity of the precious metals, or from an increased demand for them, it has generally happened, that the metallic currency, being regarded solely as a commodity, has disappeared. These two different effects may easily be accounted for; a rise in the price of bullion, occasioned by an over-issue of paper, by a diminished supply of bullion, or by an increased demand for it, is only known to, and acted upon by, comparatively a few people; the great mass of the nation, as has been already observed, in receiving or paying money, do not advert in the slightest degree to the character or value of the money as bullion, but solely to its character and value as a means of interchanging commodities; the variations in its bullion value, therefore, are unheeded both in their payments and receipts; they are, however, constantly and carefully watched by all whose business consists in dealing in bullion, and as soon as the bullion value of coin exceeds its mint value, it disappears from circulation by their means. The case is widely different, when there is any alarm respecting the credit of the paper currency; in this all are immediately and deeply concerned; all are eager to exchange it for the precious metals, and under these circumstances, as the precious metals, in their character of coin, can thus be exchanged for as much paper as they could command as bullion, there is no temptation to withdraw them from circulation. It is not just, therefore, to infer, that the paper currency of a country is not depreciated, because two prices do not exist, if the other effect of depreciation, *viz.* the disappearance of the precious metals, has taken place; each circumstance marks depreciation, but of a different kind, and arising from different causes. On the other hand, it is not fair to infer, that where the credit of the paper currency, or in other words, a difference of value between the paper currency and the coin it promises to pay, may arise, like a difference of value between any other two commodities, from the quantity of the one being increased, or the demand for it being diminished, or from the quantity of the other being diminished, or the demand for it being increased.

PAPER-Office, (in the palace of Whitehall,) is an ancient office, where all the public writings, matters of state and council, proclamations, letters, intelligences, negotiations of the king's ministers abroad, and generally all the papers and dispatches that pass through the offices of the secretaries of state, are lodged, and disposed in the way of library. It was chiefly from this noble repository that bishop Burnet had materials for his History of the Reformation.

PAPER Portraits and Pictures. One Elizabeth Pyberg, who lived at the Hague in 1699, cut in paper not only towns, as Loo and Hounslersdyke, but even faces to an extreme likeness. Mr. Ellys assures us, she did king William and queen Mary better than any limner he had ever seen, and refused 1000 guilders for the pieces; which were so curious, that he could not believe the queen's drapery not to be point till he had most accurately examined it. Vide Phil. Trans. N^o 286, p. 1418.

PAPER, Stamped. See STAMP.

PAPERS, a term used for writings, especially those relating to a man's estate, property, dealings, or the like. In which sense, papers include books of accounts, invoices, and orders; also deeds, bonds, charters, and the like.

PAPERS is also sometimes used for manuscript books.

PAPERS is more particularly used of late days for gazettes, journals, and other public news-writings.

We have daily papers, weekly papers, morning papers,
VOL. XXVI.

evening papers, occasional papers, political papers, literary papers, papers of entertainment, &c.

PAPETTO, in *Commerce*, a small silver coin of Rome, valued at two paoli. The papetto of 1775, weighs 3 dwt. 8½ gr., contains in pure silver 72.8 gr., and is valued at 10¼ d. sterling.

PAPHIS, in *Ichthyology*, a name by which some have called the gar-fish. See *Esox Belone*.

PAPHLAGONIA, in *Ancient Geography*, a province of Asia Minor, situated on the Euxine sea, between Bithynia to the W., and the gulf Amifenus towards the E.; to the S. was Galatia. When other divisions were introduced, such as the province of the Hellespont, &c. the name of Paphlagonia disappeared. On the northern coast it had a considerable promontory, that of Carambis (Kerempi.) The river Parthenius served for a considerable time as a boundary between Paphlagonia and Galatia. Towards the E. the mouth of the Halys served as a limit to Paphlagonia on that side. In the interior of the country were the Heneti or Veneti, regarded as the progenitors of those who afterwards passed over into Italy; they occupied the parts towards the N. In the centre of Paphlagonia was a country called Domaniis, which included a considerable town under the name of Germanicopolis (Kastamoni.) This country was bordered on the S. by a chain of mountains called Olgassys (mount Etkas.) In the country called Blacua, S. of these mountains, was Docea (Toussich), and towards the E. Pompeiopolis.

PAPHOS, (*Baso* or *Bafa*), a town of the island of Cyprus towards the W., at the bottom of a small creek, terminated by the promontory Zephyrium. In this town was a very ancient temple of Venus, whence her appellation "Paphian." Of its origin there have been many conjectures. Tacitus pretends, that it was built by Aerias, and that the goddess, having conceived in the midst of the waves, was landed in this place. He adds, that every one offered any victims according to his pleasure, but the most select were males. It was prohibited to spill any blood on her altar. Pausanias relates, that the Arcadians, in returning from the war of Troy, were cast by a tempest on the isle of Cyprus. Agapenor, their chief, founded a colony at Paphos, and there erected a temple in honour of Venus.

In this temple was an oracle, which was consulted by Titus, in his way to compliment Galba upon his elevation to the empire. When Cato was sent to the isle of Cyprus, he was assured by Ptolemy, that if he retired without opposition, he should want neither money nor honour, and that the Roman people would confer upon him the profitable and honourable post of chief priest of Venus. The first town that bore the name of Paphos was in the interior of the country; the second was on the sea-coast.

PAPIA, in *Botany*, a name given by Micheli, to what he supposed a new genus, in honour of Joseph del Papa, physician to several of the Tuscan princes of the Medici family, whom he celebrates for his various learning, eloquence, virtue, and affability, as well as his zeal in promoting the studies of Medicine and Botany. Whatever the merits of this gentleman might be, the plant consecrated to immortalize them, after having been named *Orvala* by Linnæus, is now considered as the very same plant with his *LAMNUM Orvala*; see that article.

PAPIAN-POPÆAN Law, in *Roman Antiquity*, was enacted by the consuls M. Papius Mutilus, and Q. Popæus Secundus. This law obliged all men to marry at a certain age, established great exemptions and privileges in favour of those that had children, and laid heavy fines on all who, after a certain age, continued single. It was also called the

Julian law, because it had been published by the order of Augustus, who was of the Julian family. The severity of this law was mitigated by Tiberius.

PAPIAS, in *Biography*, bishop of Hierapolis, a city of Phrygia, who flourished in the early part of the second century. He is supposed to have died a martyr; and the author of the "Alexandrian Chronicle" affirms, that he suffered at Pergamos, during the severe persecution in the reign of Marcus Aurelius. As these facts are not noticed by Eusebius or Jerome, Lardner does not think them entitled to much credit. Irenæus speaks of him as a hearer of John, and a companion of Polycarp; the John here mentioned is supposed by some to be the apostle of that name, but Eusebius observes, that "Papias does not say that he heard or saw any of the apostles, but only that he received the things concerning the faith from those who were well acquainted with them, that he received the apostles' sayings from those who conversed with them, and that he was a hearer of Aristion, and John the Presbyter." Eusebius and Jerome esteemed him as a good man, but extremely credulous, and of very shallow abilities, who delighted much in hearing and telling stories, and relating miracles, which he learned from tradition. But Dr. Lardner says, "I esteem the testimony very valuable, which he has given to the gospels of St. Matthew and St. John. If Papias had been a wiser man, he had left us a confirmation of many more books of the New Testament." Papias was the first person who propagated the famous notion concerning a *Millennium*, or personal reign of Jesus Christ upon earth for a thousand years after the resurrection, when he believed the elect should be gathered together at Jerusalem, and enjoy all the felicity imaginable during that period. He was author of five books, entitled "An Explication of the Oracles of the Lord," of which only a few fragments are preserved in the works of Irenæus and Eusebius. Lardner, vol. ii. edit. 1788.

PAPIER MACHE' is made of cuttings of white or brown paper, boiled in water, and beaten in a mortar, till they are reduced into a kind of paste, and then boiled with a solution of gum arabic or of size, to give tenacity to the paste, which is afterwards formed into different toys, and by pressing it into oiled moulds either of wood or of plaster of Paris. When dry, it is done over with a mixture of size and lamp-black, and afterwards varnished. See GILDING, JAPANING, and VARNISH.

PAPIGOHAVEN, in *Geography*, a bay on the E. coast of Scotland, and county of Caithness; one mile N. of Wick.

PAPILIO, the Butterfly, in *Entomology*, a genus of insects of the order Lepidoptera. The generic character is, antennæ thickening towards the extremity, commonly terminating in a knob or clavated tip; wings, when sitting, erect and meeting upwards. They fly in the day-time.

The prodigious number of species of this numerous and beautiful tribe has made it necessary to divide the whole into sections, instituted from the habit or general appearance, and, in some degree, from the distribution of the colour of the wings. "This division of the genus is," says the late excellent naturalist, Dr. Shaw, to whose labours we have frequently been indebted, "conducted by Linnæus in a peculiarly elegant and instructive manner; being an attempt to combine, in some degree, natural and civil history, by attaching the memory of some illustrious ancient name to an insect of a particular cast."

The first Linnæan division consists of *Equites*, which are distinguished by the shape of their upper wings: these are longer, if measured from their posterior angle to their anterior extremity, than from the same point to the base.

Some of this division have filiform or sharpened antennæ, in which they resemble moths, but may commonly be distinguished by their habit or general shape. The Equites are denominated *Troes* or *Trojans*, distinguished by having red or blood-coloured spots or patches on each side their breasts; or *Achivi*, *Greeks*, without red marks on the breast, of gayer colours, in general, than the former, and frequently having an eye-shaped spot at the inner corner of the lower wings.

The second division consists of *Heliconii*, which are distinguished by wings that are narrow and entire, frequently naked or semi-transparent; the upper ones are oblong, the lower ones very short.

The third division consists of the *Danai*, so called from the sons and daughters of Danaus. They are divided into *Danai candidi*, which have whitish wings; and *Danai festivi*, in which the ground-colour is never white, and the wings are variegated.

The fourth division consists of the *Nymphales*, distinguished by the edges of the wings being scolloped or indented. It is subdivided into the *Nymphales gemmati*, in which the wings are marked with eye-shaped spots; and *Nymphales phalerati*, in which the wings are without those spots.

The fifth division contains the *Plebeii*. These are commonly smaller than the preceding kinds of butterflies, and are subdivided into *Rurales* and *Urbicole*: the wings of the former are marked with obscure spots; those of the latter have for the most part transparent spots.

The above distribution, says Dr. Shaw, is not entirely accurate; the task of arrangement, though apparently very trifling, is really extremely difficult. The blood-coloured spots, mentioned by Linnæus as characteristics of the Trojans, are not always found; and the anterior angle of the wings in the Achivi is not always marked with an eye-shaped spot. The surest method, therefore, is to consider such of the Equites as are of a dark or mourning colour, as belonging to the Troes, and those of gayer or livelier ones to the Achivi. The under wings in some of the Heliconii are slightly indented, and might perhaps as well have been referred to the *Nymphales phalerati*; the under wings of the *Danai festivi* are also often indented; and the family of the *Plebeii* is also very inaccurate, many of those insects having characters which would more properly entitle them to a place in some of the other divisions.

The larvæ of butterflies are universally and emphatically known by the name of caterpillars, and are extremely various in their forms and colours; some being smooth, others beset with either simple or ramified spines, and some, especially those belonging to the division Equites, are observed to protrude from their front, when disturbed, a pair of short feelers, somewhat analogous to those of a snail. (See ENTOMOLOGY.) In our account of the species, we shall give, in general, little more than the name, specific character, and native place where it is known.

Species.

Equites. Trojans.

PARTS. Wings tailed, that is, furnished with a pair of lengthened processes, black; the lower ones with a large blue spot and purple eye, and seven lunules beneath. It is found in China, and other parts of Asia.

BIANOR. Wings tailed, black, both surfaces nearly of the same colour; the lower ones with five rufous lunules. It inhabits China, and has five red crescents on the lower wings.

HELENUS.

PAPILIO.

- HELENUS.** Wings tailed, black; the lower ones with a white spot and double purple lunule. Found in Asia.
- THESEUS.** Wings tailed, brown, both surfaces of the same colour; the lower pair with nine red lunules, dotted with white. It is found in the island of Sumatra.
- POLYTES.** Wings tailed, black, both surfaces of the same colour; the upper ones with a band composed of five white spots and red lunules. It is an inhabitant of Asia.
- MUTIUS.** Wings tailed, black; the upper ones with a white band; lower ones with a band of five red spots and lunules. It is found in the island Tranquebar. It is thought to be a variety of the last.
- HECTOR.** Wings tailed, black, both surfaces of the same colour; the upper pair with an uninterrupted white band; lower ones with numerous crimson spots. The thorax is red on each side. It is a native of the East Indies, and feeds on the *Aristolochia* or Birthwort.
- ASCANIUS.** Wings tailed, black, with a common white band, both surfaces alike; the lower ones clouded red. It inhabits Brazil.
- ANTENOR.** This is a very large species, measuring six inches and a half in extent of wings. Its colour is black, with numerous cream-coloured spots and patches; and the under wings, which are tailed, are edged with a row of red crescent-shaped spots. It is a native of India.
- TROILUS.** Wings tailed, black; the upper ones with pale marginal spots; lower ones with pale spots above, and fulvous ones beneath. Found in North America.
- ILIONEUS.** Wings tailed, black; the lower ones with a blueish border, fulvous at the angle of the tail, with red spots beneath. It inhabits Georgia.
- GLAUCUS.** Wings tailed, brown; the lower ones blue-black, fulvous at the angle of the tail, with yellow lunules beneath. It inhabits America.
- PALINURUS.** Wings tailed, black, with green-gold specks, and a common blue-green band. It is found at Tranquebar.
- CRINIS.** Wings tailed, black, with green-gold specks, and a common blue-green band; the lower ones beneath with green, blue, and cinereous lunules. It is found in Africa.
- DEIPHOBUS.** Wings tailed, black, the base beneath spotted with red; the lower ones with seven red and almost angular spots. It is found in divers parts of Asia.
- PELEUS.** Wings tailed, black; the upper ones with a white band; the lower pair with white marginal lunules, and two red dots. It is found in India.
- ASTERIAS.** Wings tailed, black, with two macular bands; angle of the tail fulvous, with a deep black dot. Found in America.
- PHORBANTA.** Wings tailed, black, spotted with blue; lower ones with an interrupted white band beneath. Found in the island of Cayenne.
- PHILENOR.** Wings tailed, black; the lower ones with a greenish gloss, and seven eye-like spots beneath. It inhabits America.
- CYRUS.** Wings tailed, black, the margin spotted with white; lower ones with a white macular band, and marked beneath with seven red lunules. A specimen is preserved in the British Museum.
- PAMMON.** Wings tailed, black, both surfaces of the same colour; the margin is spotted with white; lower ones with seven white spots.
- ASIS.** Wings tailed, black, with a common white band; lower ones spotted with red beneath, at the base, and tip. Found in South America.
- ACAMUS.** Wings indented, tailed, brown, both surfaces of the same colour; upper ones with a yellow band; lower ones with red, blue, and yellow lunules. Found in Jamaica.
- LAODOCIUS.** Wings indented, tailed, black; the upper pair with an abbreviated yellow band; lower ones with rufous, blue, and white lunules beneath. It inhabits Brazil.
- ACHATES.** Wings tailed, black, rufous at the base, both surfaces nearly of the same colour; the lower ones with a white spot divided into eight parts. It is found in China. There is a variety of this species named *Papilio Alcenor*, with brown wings, black at the base; the upper ones with a rufous spot; lower ones with white spots.
- LYSANDER.** Wings tailed, black; upper pair with a white streak; lower ones with a white spot in the middle, and red lunules. It is found in India.
- POLYDORUS.** Wings tailed, both surfaces alike, black; lower ones with a fix-cleft spot at the future, and seven red lunules. It inhabits India.
- COON.** Wings tailed, both surfaces alike; upper ones brown; lower ones black, spotted with white at the base, and a double yellow spot at the angle of the tail. It inhabits China.
- ANTIPHUS.** Wings tailed, black, both surfaces of the same colour; the lower ones with seven red lunules. It resembles the Polydorus, and is found in India.
- DARDANUS.** Wings tailed; the upper pair with a green round spot; lower ones with a red palmate spot. It is found in Brazil.
- TROS.** Wings indented, tailed, black, both surfaces alike; upper ones with an abbreviated white band; lower ones with a macular red one. It is found in Brazil.
- ANTIMACHUS.** Wings indented, elongated, black; upper ones with subradiate fulvous spots; lower ones with a radiate rufous disk speckled with black. It is found in Africa.
- PRIAMUS.** Wings indented, silky; upper pair above green, with a black disk and edge; lower ones with from four to six black spots. This, says Dr. Shaw, should take the lead, not only from the corresponding dignity of the name, but from the exquisite appearance of the animal itself, which Linnæus considered as the most beautiful of the whole papilionaceous tribe. It measures more than six inches from wing's end to wing's end; the upper wings are velvet-black, with a broad band of the most beautiful grass-green, and of a satiny lustre, drawn from the shoulder to the tip, and another on the lower part of the wing, following the shape of that part, and of a somewhat undulating appearance as it approaches the tip; the lower wings are of the same green colour, edged with velvet-black, and marked by four spots of that colour, while at the upper part of each, or at the part where the upper wings lap over, is a squarish orange-coloured spot; the thorax is black, with sprinklings of lucid green in the middle; and the abdomen is of a bright yellow or gold colour. On the under side of the animal the distribution of colours is somewhat different, the green being disposed in central patches on the upper wings, and the lower being marked by more numerous black as well as orange spots. It is a very rare insect, and is a native of the island of Amboyna.
- AMPHRSIUS.** Wings indented, black, both surfaces alike; upper ones with yellow spots; lower ones with a yellow disk.
- REMUS.** Wings indented, black, both surfaces nearly alike; lower ones with yellow marginal spots on each side. It inhabits Amboyna.
- LAOMEDON.** Wings indented; upper pair brown, lower ones

PAPILIO.

ones black, with a double rufous spot at the angle of the tail. It inhabits China.

MEMNON. Wings indented; all of them marked beneath with rufous at the base. It inhabits China.

ASTYANAX. Wings indented, black, both surfaces of the same colour; the upper ones with a striate white band, including a smaller one, lower ones spotted with black. It is found in India.

PROTENOR. Wings indented, black; the lower ones beneath with an irregular red spot at the angle of the tail. It is found in Surinam.

AGENOR. Wings indented, black, sanguineous at the base; lower ones white on the disk, with black spots. It is found in China.

ANCHISES. Wings indented, black, both surfaces alike; lower ones with seven ovate scarlet spots.

SARPEDON. This is a highly elegant species; the wings are of a lengthened shape, and the lower pair are stretched downwards into a pointed process; the whole animal is black, with a broad, interrupted, sea-green stripe, or band, passing through all the wings; on the lower part is also a border of crescent-shaped green spots.

POLYDAMAS. Wings indented, black, bronzed with a spotted yellow band; the lower ones with flexuous red lunules beneath. This is found on the *Aristolochia anguicida*.

ANDROGEUS. Wings indented, black, bronzed; the lower pair beneath with red, blue, and yellow lunules. It inhabits Surinam.

PERANTHUS. Wings indented, tailed, black; above green at the base, beneath pale at the tip, lower ones with seven fulvous lunules. It is found in China.

AMPHIMEDON. Wings indented, brown, both surfaces alike; upper ones radiate with white, lower ones with a five-cleft red spot, and red lunules. It inhabits Amboyna.

ZACYNTHUS. Wings indented, black; the upper ones with a green-white spot, lower ones with a palmate red one. It inhabits Brazil.

DIMAS. Wings indented, black, both surfaces alike; the upper wings with a white spot divided by the veins; lower ones with a palmate red spot. This also is a native of Brazil.

IDÆUS. Wings indented, black; upper pair with an abbreviated yellow band; lower ones with a palmate red spot and dots. Found at Madras.

VERTUMNUS. Wings indented, black; upper pair with a round green spot in the middle; lower ones with a palmate sanguineous spot. Inhabits Surinam.

ÆNEAS. Wings indented, black; upper pair with a green spot above; lower ones with a red palmate spot. It is found in India.

ILUS. Wings indented, black; upper pair with a white spot, lower ones beneath with red dots at the base and angle of the tail. This is an American insect.

IPHIDAMUS. Wings indented, black, both surfaces uniform; upper pair with an abbreviated white band; lower ones with a broad red one.

BELUS. Wings indented, greenish; lower pair rather pale at the inner margin, beneath brown, with red lunules. It inhabits Surinam.

POMPEIUS. Wings indented, black, both surfaces uniform; lower pair with red spots. It inhabits Surinam.

POLYMNESTOR. Wings indented, black, both surfaces nearly of the same colour; lower pair blueish towards the tip, and spotted with black and white. Found in divers parts of Asia.

PANTHOS. Wings indented, black, both surfaces uni-

form; upper pair spotted with white, lower ones with white spots, including some black ones. It is found in India. There is a variety in which the upper wings are clouded; lower ones with yellow spots.

PANDARUS. Wings slightly indented, both surfaces nearly alike, blackish, spotted with white; lower pair yellow, with seven black eyes; the pupil blue. It inhabits India.

ASTENOUS. Wings indented, black, both surfaces of the same colour; upper pair with a radiate white spot; lower ones yellow on the disk. It inhabits the Cape of Good Hope.

HELENA. Wings indented, black, both surfaces alike; common disk of the second pair of a brilliant gold-colour. It inhabits Surinam.

HELLACOR. Wings indented, black, both surfaces alike; disk of the lower ones yellow, dotted with black. It inhabits India.

EURYPYLUS. Wings indented, black, both surfaces alike, with an interrupted green band and spots; lower pair beneath spotted with red. It inhabits India.

CRESSIDA. Wings indented; upper pair hyaline, with two black spots; lower ones black, with a white spot. It is found in New Holland.

HARMONIA. Wings scalloped, white; both surfaces alike; upper pair with a black spot; under ones with a brown margin, and five white dots. It inhabits New Holland.

Equites. Greeks.

RIPHEUS. Wings with six tail-like processes, black with green bands; lower ones with a large red patch, enclosing two black dots. It inhabits Coromandel.

LELUS. Wings tailed, both surfaces alike, black with a shining green band, and numerous narrow stripes. This is an American insect.

LAVINIA. Wings tailed, black, barred with green, beneath silvery with fulvous stripes. It inhabits America.

BRUTUS. Wings tailed, white, with a black border; lower pair with a brown band beneath. It inhabits Africa.

DOLICAON. Wings tailed, white, with a common black border; lower ones with marginal white dots on each side. It inhabits America.

ULYSSES. Wings tailed, black, with a blue radiating disk; lower pair with seven ocellate spots beneath. This species is found in Asia.

DIOMEDES. Wings tailed, black; the disk unequally radiate with blue; the lower ones with blue lunules. It inhabits India.

PROTESILAUS. Wings tailed, both surfaces nearly alike, white with brown bands, and a single red one beneath; angle of the tail red. It is found in America.

ANTIOCHUS. Wings tailed, both surfaces alike, yellow, with black bands and margin; the tail is white, and as long as the wings. It is an inhabitant of North America.

* **PODALIRIUS.** Wings tailed, both surfaces nearly alike, yellowish, with double brown bands and margin; lower ones with five blue ocellate spots, and a reddish line beneath. This is found in our own country, and other parts of Europe. Mr. Donovan has given a figure of it.

ANTIPHATES. Wings tailed, white; the margin brown, barred with white; the lower ones beneath yellowish at the base, and barred with black. It inhabits America.

ALCIBIADES. Wings tailed, white; upper ones with black bands on the margin; lower ones beneath ferruginous

PAPILIO.

at the tip, dotted with black. It inhabits Tranquebar. Is less than the *P. podalirius*.

POMPILIUS. Wings tailed, white; the border barred with white; lower ones beneath with ferruginous spots, marked with black. This is an Indian insect.

STIXON. Wings tailed, black, with green entire band, stripes, and dots; lower ones with a red line underneath. It is found in India, and is half the size of the *Podalirius*.

AGAPENOR. Wings tailed, black, with green macular bands; lower ones with a fanguineous line beneath. Found in Africa.

THYASTES. Wings tailed, black, with a yellow band and spots; lower ones with a red line beneath. It inhabits Brazil.

CHIRON. Wings tailed, black, barred with brown; underneath white, on the fore part with ferruginous streaks. It inhabits India.

CRITHON. Wings tailed, above brown, beneath glaucous, with a white band on both sides. It is a small brown insect, and inhabits Surinam.

ORSILOCHUS. Wings tailed; upper ones with two white bands; lower ones with one; beneath white at the base, with a fulvous band. This also is an inhabitant of Surinam.

CURIUS. Wings tailed, both surfaces alike, black; upper pair with two hyaline bands; lower ones with a single white one. It inhabits Siam. A specimen is preserved in Sir Joseph Banks' museum.

OCTAVIUS. Wings tailed, hyaline, with a red margin and stripe. It inhabits Surinam.

LICARSIS. Wings tailed, black, with two white bands; the angle of the tail has two red dots. Found also in Surinam.

MELIBŒUS. Wings tailed, brown; upper pair with a red stripe; lower ones with two; beneath shining blue. It inhabits Surinam.

HOMERUS. Wings tailed, black, with a yellow band; lower ones yellowish underneath, with seven eyes. It inhabits America.

TURNUS. Wings tailed, both surfaces alike, yellow, with black margin, and five abbreviated bands; angle of the tail fulvous. Found in America.

* **MACHAON.** This is an insect of great beauty, and may be considered as the only British species of *Papilio*, excepting the *Podalirius*, belonging to the tribe of Equites. It is commonly known among the English collectors by the title of the Swallow-tailed butterfly, and is of a beautiful yellow, with black spots or patches along the upper edge of the superior wings; all the wings are bordered with a deep edging of black, decorated by a double row of crescent-shaped spots, of which the upper row is blue, and the lower yellow. The under wings are tailed, and are marked at the inner angle or tip with a round red spot, bordered with blue and black. The larva, or caterpillar of this species, feeds principally on fennel, and other umbelliferous plants, and is sometimes found on rue. It is of a green colour, encircled with numerous black bands, spotted with red, and is furnished on the top of the head with a pair of short tentacula of a red colour, which it occasionally protrudes from that part. In the month of July it changes into a yellowish-grey angular chrysalis, affixed to some part of the plant, or other neighbouring substance, and from this chrysalis, in the month of August, proceeds the complete insect. It frequently happens that two broods of this butterfly are produced in the same summer; one in May, having been in the chrysalis state all the winter; the other in August, from the chrysalides of July.

THERSITES. Wings tailed, yellow, with a black border;

lower ones with yellow lunules. It is found in America. A specimen is found in Dr. Hunter's museum.

CODRUS. Wings tailed, above black, underneath brown; upper ones with a macular white band on each side. This is found in Amboyna.

CHALCUS. Wings tailed, black, with two yellow macular bands; lower ones beneath with a yellow fillet and rufous lunules. Found in America.

MENESTHEUS. Wings tailed, black, beneath with whitish spots in streaks; lower ones with rufous and blueish lunules. It inhabits India.

XUTHUS. Wings tailed, black, with white spots in streaks; lower pair underneath with subfasciate blue and fulvous. It inhabits India.

THESANDER. Wings obtusely tailed, brown, with a yellow band and macular streaks; lower ones beneath chestnut-brown, on the disk with black lines. It inhabits Sierra Leone.

THOAS. Wings tailed, black-brown, with ochre yellow bands; lower pair yellow beneath, with a black band and blue lunules. This is found in South America. Dr. Shaw has given a figure of it.

CRESPHONTES. Wings tailed, black, with a green band; lower ones with a blue band beneath. Found in India.

POLYCAON. Wings indented, tailed, black, with a yellow band; lower ones with fulvous blue and yellow lunules beneath. It is found in Surinam.

AJAX. Wings tailed, both surfaces alike, brown with yellow bands, lower ones beneath with red streaks, and fulvous at the angle of the tail. Found in North America.

AGAMEMNON. Wings tailed, black spotted with green; lower ones with three rufous lunules beneath. It inhabits Asia.

ORESTES. Wings slightly tailed, above black, beneath yellowish, all of them with a snowy disk and two black bands. It inhabits Africa.

PYLADES. Wings indented, snowy, with a black border dotted with white; angle of the tail with a rufous eye. This also is an African insect.

DEMOLEUS. Wings indented, black, with yellow spots and bands, the under ones with a blue and rufous eye. It is found in different parts of the East Indies.

EPIUS. Wings indented, brown spotted with yellow; lower ones with a rufous spot at the angle of the tail. It is found in China.

LEONIDAS. Wings indented, both surfaces nearly alike, black spotted with green, lower ones with a green disk. It inhabits various parts of the continent of Africa.

TYNDERÆUS. Wings indented, black spotted with green; lower ones varied beneath with green, brown, and red, the base dotted with black.

ANTHEUS. Wings indented, black barred, and spotted with green; lower ones variegated beneath, with three red lunules. It is found in Amboyna.

NIREUS. Wings indented, black, with a green gilt band, beneath blackish. It is found in India.

LACEDÆMON. Wings indented, black, with whitish marginal lunules; lower ones chestnut brown, with seven black lunules beneath. Inhabits Malabar.

ZENOBIÆ. Wings indented, black, with a common white band, and marginal spots; lower ones beneath yellow at the base, and striate with black. It inhabits Sierra Leona.

CYNORTA. Wings indented, black, with a snowy band; lower ones beneath yellow at the base, dotted and striate with black.

AMPHIMACUS. The wings of this insect are indented, black,

PAPILIO.

black, with a shining blue band; beneath white on the fore part, cinereous behind. It inhabits India.

AMPHITRION. Wings indented, black, with an unequal yellow band; lower ones beneath with a stripe of yellow dots and blue lunules. Inhabits America.

HIPPOCOON. Wings indented, black, spotted with white, the common disk white. It inhabits Sierra Leona.

DISSIMILIS. Wings indented, with dilated veins, black, with white arrow-shaped spots; lower ones with marginal yellow spots beneath. Found in Asia.

ASSIMILIS. Wings slightly scalloped, both surfaces alike, black, with blueish-white dots; lower ones with scarlet dots.

HYPSPYLE. Wings indented, yellow, varied with black and radiate at the tip; lower ones with seven red dots. Found in the southern parts of Europe on the *Aristolochia clematitis*.

TRAPEZUS. Wings entire, fulvous; all of them with four blind eyes. Found in Russia.

FORTUNATUS. Wings entire, brown; lower ones marbled with white; black beneath. It inhabits Lapland.

CLYTUS. Wings very entire, brown; upper pair with a yellow band, lower ones with five eyes. It inhabits Africa.

HYPERBIUS. Wings very entire, brown, with a fulvous patch; upper ones with a bipupillate eye, lower ones blind beneath. It is found in divers parts of Africa.

CASSUS. Wings very entire, brown; upper pair with a double eye; lower ones with three eyes.

FLORIMEL. Wings very entire, brown; under surface of the upper ones with two eyes, of the lower ones with seven.

PHILOCLE. Wings very entire, brown; upper pair with a tripupillate eye, lower ones with transverse wavy lines. It inhabits India.

RENATUS. Wings very entire, both sides alike, black, with a common white band; upper pair with a tripupillate eye. It is found in Surinam.

CRÆSUS. Wings very entire, blue, with numerous black streaks; upper ones with a tripupillate spot above. It is found in Surinam.

* **HYPERANTHUS.** Wings entire, brown; under side of the upper pair with three eyes, the lower ones with five. It is an European insect and found in this country.

CLERIMON. Wings slightly scalloped; upper pair with a black eye above, all of them with four minute eyes beneath.

ZACHÆUS. Wings entire, brown, with two eyes above; under side of the upper pair with four, of the lower ones with six eyes. All the eyes have a white pupil.

ETHUS. Wings very entire, brown; upper pair with a bipupillate eye; lower ones with three eyes above, beneath black, with a white dot in the middle. It is found among the highest mountains of Lapland.

OEDIPUS. Wings very entire, above black, immaculate; beneath brown, with about three eyes on the upper, and five on the lower ones. It inhabits Russia.

ZANGIS. Wings very entire, brown; all of them beneath with a single eye, that on the upper ones bipupillate. It is found in Carolina.

PHOCION. Wings entire, above brown, immaculate; lower ones beneath with yellow streaks, and three oblong eyes. It is preserved in the British Museum.

AREOLATUS. Wings very entire, above brown, immaculate; beneath with a common testaceous streak, margin, and circles, on the upper pair four eyes, on the lower ones

six, the middle ones elongated. It is found in Georgia, and has been supposed to be a variety of the *P. canthus*.

SOSYBIUS. Wings very entire, above brown, immaculate; under surface of the upper ones with five eyes, of the lower ones with six, the middle ones blind.

PERSEUS. Wings very entire, brown; under side of the upper ones with ocellar spots, of the lower ones with seven. It inhabits New Holland.

MARTIUS. Wings very entire, black; under side of the upper pair with four, of the lower ones with seven ocellar spots.

TERMINUS. Wings entire, brown, with a rufous patch; upper pair with a single eye above, lower ones with four. Found in New Holland. A specimen is preserved in the museum of Sir Joseph Banks.

SIRIUS. Wings very entire, dull rufous; upper pair with two eyes above, lower ones with four. This is also a New Holland insect, and is likewise in Sir Joseph Banks' museum.

CORNELIUS. Wings very entire, dull, cinereous; lower ones with four approximate eyes.

DAVUS. Wings very entire, fulvous; upper pair with an eye, and white bands beneath, lower ones with six eyes. It is found in Germany.

* **PAMPHILUS.** Wings very entire, yellow; under side of the upper ones with a single eye, of the lower ones cinereous, with a band and four obliterated eyes. This and the next species are found in England and other parts of Europe.

* **ARCANIUS.** Wings very entire, ferruginous; under surface of the upper ones with a single eye, of the lower ones with five, separated by a band.

LEANDER. Wings very entire, brownish; lower pair beneath cinereous, with fulvous tip and six eyes. Common in the southern parts of Europe.

SABÆUS. Wings entire, brown; upper pair with four blind eyes above, and six pupillate ones beneath.

* **HERO.** Wings very entire, fulvous; under surface of the upper pair with a single eye, of the lower one with six. This is an English insect, and is described and figured by Mr. Donovan.

ARCTUOUS. Wings entire, brown; upper pair with bipupillate eye on both sides; lower ones nearly blind. Found in New Holland. A specimen is in the museum of Sir Joseph Banks.

PHRYNEUS. Wings entire, above white, beneath brown, with white veins and five eyes. Found in Russia.

HYPHEUS. Wings entire, both sides alike, white with brown bands; upper pair with a black eye, lower ones brown. Inhabits the East Indies.

BALDUS. Wings very entire, brown; upper pair with an eye on each surface, the pupil double; lower ones with four eyes above, and six beneath. It is a small insect and a native of India. A specimen is in the museum of Dr. Hunter.

MAGUS. Wings very entire, dull, fulvous; upper pair with an eye on each side, the pupil double; lower ones with two eyes above and three beneath.

DROMUS. Wings very entire, black; upper pair with the disk rufous, in which is a double eye. It inhabits Italy, and is a small insect.

EUMENUS. Wings very entire, half brown; upper ones with a black tripupillate eye on both surfaces. It inhabits the West Indies.

EPHYNEUS. Wings very entire, blue, with purple bands; upper pair with an eye on each side, which is tripupillate beneath. It inhabits Surinam.

TULLIUS.

PAPILIO.

TULLIUS. Wings very entire, dull, cinereous; upper pair brown at the tip, with a tripupillate eye on each side. It inhabits Cayenne.

ACTÆA. Wings scalloped, above brown; upper pair with two eyes and two white dots; lower ones marbled beneath. It inhabits Russia.

FIDIA. Wings indented, above brown; upper pair with two eyes and two white dots; lower ones with an angular black streak beneath. It inhabits Africa.

FERULA. Wings scalloped, black; under side of the upper pair with two eyes, of the lower with cinereous bands. Inhabits Italy.

CORDULA. Wings indented, brown; upper pair with two eyes, and two white dots on both sides, lower ones with two black dots. It inhabits Italy, and is the size of the former ones.

FAUNA. Wings indented, above brown; upper pair with two eyes, and two white dots; lower ones grey beneath. It inhabits Germany.

FERONIA. Wings indented, marbled with blue, brown, and white on the upper surface, all of them with six eyes. It inhabits the East Indies.

* **MÆRA.** Wings indented, brown; upper pair with an eye, including a lesser one on both sides; lower ones with three eyes above, and six beneath. Found in this country, as the asterisk denotes.

ROXELANA. Wings indented, brown; above blind; lower ones waved beneath, with seven eyes, the inner one with a double pupil. It inhabits several parts of Asia.

PROSERPINA. Wings indented, fulvous; upper pair black at the tip, with yellow dots; lower ones marked beneath with four eyes, the middle ones blind. A specimen is in the museum of Sir Joseph Banks.

LYCAON. Wings indented, upper pair brown and spotted with yellow and white; lower ones ferruginous, with six blind eyes; beneath variegated.

ALOPE. Wings indented, brown; upper pair with a yellow band on each side, and two eyes; lower ones with a single eye above, and six beneath. It inhabits India.

CLUERIA. Wings indented, brown; lower ones with a blue band, in which are five black eyes; a brown band beneath, with five eyes.

LACHES. Wings indented, brown, with a blue band beneath; upper pair with five eyes, lower ones with six. Inhabits Guiana.

HERSE. Wings indented, rusty-brown; upper pair dotted with white; lower ones with seven blind eyes.

DEJANIA. Wings indented, brown; upper pair with five eyes on each side; lower ones with six, and a white scalloped band. It is found in Germany.

PEGALA. Wings indented, brown; upper pair with a rufous band and single eye; lower ones with an eye above, and six beneath. This is an American insect, and is found in Dr. Hunter's museum.

BRISEIS. Wings indented, brown, with a green gloss and white band; the upper ones have two eyes; the lower ones none. Found in Germany. The eyes, in this species, are sometimes wanting on the upper surface.

MANTO. Wings slightly indented, brown; with four ocellar dots on the upper and three on the lower wings; the under face of the latter cinereous with brown waves. It is found in Austria.

AUTONOE. Wings indented, brown, subfasciate with yellow and two pupillate eyes; upper ones brown at the base beneath. It is found in Russia.

* **SEMELE.** Wings indented, brown, with a macular fulvous marginal band, in which are two eyes; upper pair

with a fulvous disk at the base beneath. It is found in divers parts of Europe.

ARETHUSA. Wings indented, above brown, with a macular rufous band; upper pair with a single eye on each surface. It is found in Germany.

HERMIONE. Wings indented, brown, with a pale band; upper pair with two eyes above, and one beneath. It is found in France and Germany.

CIRCE. Wings indented, brown, with a white band on both surfaces; upper pair with a single eye. This is an European insect.

* **PHŒDRA.** Wings indented, brown, both sides alike upper pair with two violet eyes.

PERIBŒA. Wings indented, brown; upper pair with an obsolete eye, a yellowish streak beneath; lower ones with ocellar black dots. Inhabits Surinam.

DELILA. Wings scalloped, brown; upper pair with a small eye; under side of the upper one with two eyes, of the lower one with six, the fourth larger. It inhabits Guinea, and is middle-sized.

LIGEA. Wings indented, brown, with a rufous band; upper pair with four eyes, the lower with three on each surface, all spotted with white beneath. Found in Europe.

BATHSEBA. Wings scalloped, brown, with the disk ferruginous; upper pair with a bipupillate eye on both sides, lower ones beneath brown, with a white band. It is found in Barbary.

MEDUSA. Wings slightly scalloped, brown, both surfaces alike, all of them with a yellow macular band, and about four eyes. This is found in Austria.

EPIPHRON. Wings entire, black with a red band; upper pair with two eyes above and three beneath, lower ones with three above and five beneath. It inhabits Germany.

BLANDINA. Wings indented, brown, with a rufous ocellate band; lower ones brown beneath, with a cinereous band. Found in Germany.

GRIELA. Wings slightly indented, black; upper pair with four connected spots on each side. It inhabits the highest mountains of Lapland.

ÆRA. Wings entire, brown with six eyes; lower ones covered with cinereous down. It inhabits Russia.

ERINA. Wings indented, brown, with a macular fulvous band and ocellar black dots. It is found in Germany.

ARACHNE. Wings entire, black, upper pair with a rufous band on each side, containing two eyes; lower ones with an indented cinereous band beneath. It inhabits Austria, and is the size of the last.

PYRRIA. Wings entire, brown, with a red band, which is dotted with black on the upper pair, and macular on the lower ones. It inhabits Austria.

CASSIOPE. Wings entire, brown, with a rufous band, containing three ocellate black spots; the lower ones with only dots beneath.

ARETE. Wings entire, brown with a rufous band; lower ones with a stripe of white dots on each side. It inhabits the mountainous parts of Austria.

SALOME. Upper wings brown, with a rufous band containing a single eye; lower wings with three eyes, beneath an indented white streak, and five eyes. This species is found at Gibraltar.

* **GALATHEA.** Wings indented, varies with brown and yellowish-white; under surface of the upper one with a single eye; of the lower ones with five.

ARGE. Wings indented, white streaked with black; upper

PAPILIO.

upper pair with a single eye, the lower ones with five. Found in Russia.

LIRIA. Wings slightly indented, cinereous, with brown waves; the upper pair has a white band, lower ones with four ocellar white dots. It inhabits India.

PILOSELLÆ. Wings indented, brown, with a yellowish disk; upper pair with a black eye, and double pupil on each side; lower ones with snowy ocellar spots beneath. It is found in many parts of Germany.

IDA. Wings slightly indented, brown, with a yellow disk; the upper pair with a black bipupillate eye on each side, the lower ones varied with grey beneath.

MELUFONA. Wings indented, brown, with a white disk; lower surface whitish, with two eyes on the upper pair, and seven on the lower ones.

CADMA. Wings indented, fulvous; lower ones beneath white on the disk, with two eyes, the pupil double, blue. Inhabits America.

* **JANEIRA.** Wings indented, brown; upper pair beneath yellow, with a single eye on each side; lower ones with three dots beneath. In the female, the upper pair of wings has a yellow patch, including a single eye on each side.

CLYMENE. Wings indented, brown, with a ferruginous patch; lower ones with about three eyes above, and seven beneath. Inhabits Russia.

MIRIAM. Wings indented, brown, beneath cinereous, with two eyes on the upper pair, and seven on the lower. It inhabits India.

EUDORA. Wings indented, brown; upper pair with a ferruginous disk on each side, containing a single eye in the male, and two in the female. It inhabits Germany.

TABITHA. Wings indented, black; upper pair with a single eye; all of them paler beneath, with a streak of ocellate dots. It inhabits the East Indies.

TISIPHONE. Wings indented, brown; upper pair with two eyes on each side, lower ones with six. The pupils all are violet. It is found in Germany.

HALYMA. Wings indented, above brown, immaculate, beneath with yellow bands; upper pair with five eyes, the lower with seven. It inhabits India.

RUMINA. Wings indented, variegated; upper pair with six red dots above, lower ones with four. It inhabits the southern parts of Europe.

FLEGIA. Wings indented, both sides alike, fulvous, with numerous brown dots. It inhabits Cayenne.

ALLICA. Wings indented, both surfaces nearly alike, obscure, fulvous, with numerous black spots, each including a white one. It inhabits Siam.

MELICERTA. Wings indented, both sides alike, black dotted with white; upper pair with a common white interrupted band. This is an African insect.

ACERIS. Wings indented, with black bands, above black, beneath fulvous. This is found in many parts of Europe and Asia.

ACESTE. Wings scalloped; upper pair black, with a yellow band and base, lower ones yellow, with brown bands beneath. Found in India.

SULPITIA. Wings indented, black, with a common white band; lower ones yell. with beneath, with black dots at the base, a white band in the middle, and dots at the tip.

SIBILLA. Wings indented, above brown, beneath ferruginous, spotted with black, and a macular white band on both surfaces. It inhabits Europe.

* **CAMILLA.** Wings indented, dark brown, with a white band, and dots on each side; lower ones silvery blue at the base.

LUCILLA. Wings indented, above brown, beneath

chestnut-brown, with a macular white band both sides. It inhabits Austria.

CÆNOBITA. Wings indented, black; upper pair with a white streak and spots; lower ones with a white band above, beneath white, with four brown bands and marginal spots. It inhabits India.

HERSILIA. Wings indented, white, with a fulvous border, lower ones fulvous, beneath two white bands, and a dot in the middle. It inhabits America.

SOPHIA. Wings indented, varied with yellow, fulvous and black, the margin brown, dotted with black; white lunules on the lower ones. It inhabits India.

DORICLEA. Wings scalloped down; lower ones with a fulvous band dotted with black, and a black dot beneath. It inhabits India.

AUGE. Wings indented, brown; upper pair with three green bands; lower ones with a fulvous band dotted with black, a black dot at the base beneath. It inhabits India.

ETHESIA. Wings indented, black, with a yellow disk; beneath varied with brown and yellow, the base dotted with black. It inhabits Africa.

NARVA. Wings indented, black, with a line of white dots behind; upper pair with yellow spots, lower ones with a yellow disk. This is found in Africa.

MARDANIA. Wings indented, fulvous; upper pair black at the tips, with a white band; lower ones with four ocellar yellow spots.

COCALIA. Wings indented, brown; upper pair spotted with black and yellow; all of them grey beneath, with a line of white dots. It inhabits India.

* **LUCINA.** Wings indented, brown, with testaceous spots; lower ones with two rows of whitish spots beneath. It inhabits Europe.

* **CINXIA.** Wings indented, fulvous, with black spots; lower ones with three whitish bands, dotted with black beneath. It inhabits Europe.

PÆEBE. Wings indented, varied with black and fulvous; lower ones beneath yellowish, waved with black, the base with four black spots, and two fulvous bands, the hinder one composed of spots. This is an European insect.

DIDYMA. Wings indented, fulvous, spotted with black; lower ones beneath yellow, dotted with black, with two continued fulvous bands. It inhabits Russia.

FASCELIS. Wings indented, varied with fulvous and brown; lower ones beneath white, dotted with black, with two fulvous bands, the lower composed of lunules.

ATHALIA. Wings scalloped with fulvous, dotted with black; lower ones beneath white, dotted with black, with two fulvous bands. It inhabits Russia.

HYLLA. Wings indented, fulvous, speckled with black; lower ones brown at the base, beneath whitish. This is found in the East.

* **DICTYNNA.** Wings indented, black, with fulvous spots; lower ones beneath fulvous, with white spots at the base, and band in the middle, the tip with yellow lunules.

CYNTHIA. Wings indented, black, with fulvous and yellow bands; lower ones beneath fulvous, with yellow bands. It inhabits Austria. In the male there are a few white spots.

* **MATURNA.** Wings indented, varied with fulvous and black; lower ones beneath with yellow bands, and waved black streaks, the base impunctured. It inhabits Europe.

ARUINA. Wings indented, fulvous, spotted with black; lower ones beneath white, with two fulvous bands, the lower speckled with black. This is found in Russia.

HECATE. Wings indented, fulvous, spotted with black;

PAPILIO.

all of them with two streaks of black dots at the tip. This is found in Aultria.

* **ARTEMIS.** Wings indented, fulvous, variegated with black; lower ones with a streak of black dots on each side.

AMATHUSIA. Wings indented, fulvous with black spots, and a punctured streak; lower ones variegated beneath, a black dot at the base, and a streak at the tip.

* **DIA.** Wings fulvous, spotted with black; lower ones beneath purple, the base with yellow and silvery spots, and an obsolete silvery band in the middle.

DRYOPE. Wings indented, brown, with rufous spots, the tip fulvous; beneath with rufous spots, furrounded with a white ring. It inhabits Sierra Leona.

* **LEVANA.** Wings denticulated, variegated, beneath reticulate, upper ones with a few white spots.

PRORSA. Wings indented, brown, beneath reticulate with white; the upper pair with a white interrupted band on each side. This is an European insect.

PANDORA. Wings indented, fulvous, spotted with black; lower ones beneath scarlet, immaculate.

PALES. Wings slightly indented; fulvous, with black base and spots; lower ones beneath nut-brown, and variegated with yellow and silvery. This is found in Aultria.

DAPHNE. Wings indented, fulvous, spotted with black; lower ones beneath yellow, with rufous veins, the tip silvery, ferruginous. Inhabits Aultria, and is found on the *Rubus idæus*.

Heliconii.

HORTA. Wings entire, red, upper one hyaline at the tip, lower ones beneath whitish dotted with black. This is an inhabitant of Africa.

QUIRINA. Wings entire, hyaline; disk of the upper pair fulvous, speckled with black. This is found at Madras.

CALLIOPE. Wings entire, yellow; upper pair with three black streaks; lower ones with three black bands. It inhabits India.

MELITE. Wings entire, yellow; upper pair black, with two yellow lines, and a band. Inhabits India.

MOPSA. Wings entire, both surfaces alike, yellow and black, the margin dotted with white. It inhabits India.

MNEME. Wings entire, fulvous, spotted with black; upper pair black at the tip, with yellow spots; lower ones black, with a fulvous band behind. It inhabits India.

LYCASTE. Wings entire, fulvous, tipped with black; upper pair spotted with yellow.

LYSIMNIA. Wings entire, fulvous, with a yellow band, the tip black, with a white spot on the upper pair.

CLARA. Wings scalloped, black, spotted with yellow, and a common testaceous base. It is found in Surinam.

EGENA. Wings entire, upper pair fulvous, with a yellow band, the tip spotted with yellow, and a row of white dots on each side. This is an American species.

EVA. Wings entire, both surfaces alike, black; upper pair with fulvous streaks at the base, and spots at the tip, disk of the lower ones fulvous, with a black band. It inhabits Surinam.

LYBIA. Wings entire, upper pair black, with two fulvous bands; lower ones fulvous, with a marginal black band. It inhabits India.

VESTA. Wings entire, yellowish, the margin dotted with black. It inhabits China.

HYPARTIA. Wings entire, fulvous, dotted with black, the margin black, immaculate. It inhabits Africa.

VIOLÆ. Wings entire, fulvous, dotted with black; mar-

gin of the lower ones black, with seven white dots. It inhabits India.

TERPSICORE. Wings entire, fulvous; lower pair dotted with black. It inhabits Asia.

SERENA. Wings entire, fulvous; base of the lower pair beneath dotted with black. Found in India.

POLYMNIA. Wings entire; upper pair with black spots, and tip and yellow band; lower ones with three black bands, the middle one ferrate. This is found in America.

HIPPODAMIA. Wings entire, upper pair black, with three hyaline bands; the lower ones are likewise hyaline.

IRENE. Upper wings black, with yellow spots, and a fulvous line at the base; lower ones fulvous, edged with black. It inhabits America.

SAPPHO. Wings entire, both surfaces alike, black-blue; upper pair with a white band; lower ones edged with white. Inhabits Jamaica.

URANIA. Wings entire, brown, with a white disk; lower ones with two eyes each. This is found in India.

DORIS. Wings entire, black; upper pair spotted with yellow; lower ones radiate, with blue at the base above. It is found in Surinam.

OLYMPIA. Wings entire, black; upper pair with an oblong fulvous spot at the base, and white ones at the tip, lower ones fulvous at the base.

CRISIA. Wings entire, black; upper pair acuminate with a yellow band; lower pair with a yellow disk. It inhabits America.

HECALE. Wings entire, black; upper pair with a white band; lower pair with white marginal dots beneath. Found in Surinam.

RICINI. Wings entire, brown; upper pair with two yellow bands on each side; lower ones rufous at the base. It inhabits America.

SARA. Wings scalloped, black, with a blue base; upper pair with two yellow bands; lower ones with red beneath. It inhabits Guiana.

ARANEA. Wings black; upper pair with a yellow streak at the base, and two bands; lower ones with a red band beneath.

BRASSOLIS. Wings entire, brown; upper pair spotted with yellow; lower ones beneath with red rays. It inhabits Surinam.

THALES. Wings nearly entire, and alike on both surfaces, black, with red rays at the base; the upper pair is spotted with yellow. It inhabits Surinam.

MYRTI. Wings entire, black; upper pair with two yellow bands; lower ones with a rufous disk. It inhabits Surinam.

NASICA. Wings entire, black; upper pair with two yellow bands; lower ones with a yellow disk.

CEPHA. Wings entire, black; upper pair with an abbreviated white band; lower ones fulvous at the base, and radiate beneath. It inhabits Cayenne.

PSIDI. Wings entire, brown; upper pair with three hyaline bands, lower ones with two. It is found in India.

ASPASIA. Wings entire, black, with hyaline streaks and spots; lower ones yellow at the base. It inhabits Tranquebar.

ÆGLE. Wings entire, black; upper pair with hyaline spots; lower ones with a hyaline disk.

CHARITONIA. Wings entire, black, upper pair with three yellow bands, lower ones with two. Inhabits America.

MELPOMENE. Wings entire, black; upper pair with a red band; lower ones with red dots at the base beneath. It inhabits America.

PAPILIO.

PHYLLIS. Wings entire, black; upper pair with a red band; lower ones with a yellow one. It inhabits Brazil.

CLIO. Wings entire, brown; upper pair spotted with white; lower ones with a white band. It inhabits America.

THALIA. Wings entire, brown; upper pair spotted with yellow; lower ones striate. It inhabits India.

ROSALIA. Wings entire, both surfaces alike, fulvous; upper pair with a yellow spot; lower ones with two black streaks. Inhabits Surinam.

EURYTA. Wings entire, both surfaces alike brown, with a white band; lower ones striate, the base is dotted with black.

UMBERA. Wings entire, brown, with a testaceous base; lower ones speckled with black.

AEDEA. Wings entire, spotted with white; upper pair greenish; lower ones with a yellow band. It inhabits India.

THALLO. Wings entire, black; upper pair with two yellow bands; lower pair with a single one. It inhabits China.

ANTICHA. Wings entire, black; upper pair with two white bands. It is found in India.

CAMOENA. Wings nearly entire, brown, dotted with black; lower ones with a red band. It inhabits Africa.

MACARIA. Wings entire, brown; upper pair with a black base, and broad rufous band in the middle; lower ones dotted with black at the base.

ZETES. Wings brown, dotted with black; lower pair with a fulvous band, dotted with black, the margin beneath with pale dots. It inhabits Guinea.

PERSIPHONE. Wings entire, brown, dotted with black; upper pair with a white spot, margin of the lower ones black, immaculate.

GEA. Wings entire, black; upper pair with two spots; disk of the lower ones fulvous, striate with black, the base beneath is striate with black. This species inhabits Africa.

JODUTTA. Wings entire, black, upper pair with two white spots, disk of the lower ones white, striate with black, the base beneath dotted with black.

PARRHASIA. Wings entire, black; upper pair with a four-cleft fulvous and hyaline spot; lower ones with a fulvous band, beneath yellow with black dots and lines.

LYCIA. Wings entire, both surfaces alike, brown, spotted with white; disk of the lower ones white, with black dots. It inhabits Sierra Leona. There is a specimen in Sir Joseph Banks' Museum.

PYRRHA. Wings entire, both surfaces alike, brown, spotted with yellow; disk of the lower ones ferruginous, striate with black. It inhabits Brazil.

PASIPHLE. Wings entire, brown, varied with white, with black spots and margin. It inhabits Guinea.

MARCIA. Wings entire; upper pair brown, immaculate; lower ones yellowish, dotted with black. This, and also the two next, are found in Africa, and specimens are preserved in Sir Joseph Banks' Museum.

COECILIA. Wings white, in the middle dotted with black; margin of the lower ones black, beneath it is dotted with white.

BONASIA. Wings entire, brown, with a common fulvous band; base of the lower ones dotted with black.

EUTERPE. Wings entire, black, with a fulvous band and white dots. It inhabits America.

SUSANNA. Wings entire, black, dotted with white, a fulvous spot at the base and band behind. It is found in Africa. A specimen is in Sir Joseph Banks' Museum.

HYPARETE. Wings entire, white, with black veins; lower ones beneath yellow, the margin spotted with red. It inhabits India.

PASITHOE. Wings black, slightly radiate, with white, and a central white dot; lower ones beneath sulphur, with black margin and veins; the base is red. There is a variety, in which the wings are entire, black, spotted with white; lower ones beneath yellow on the disk, with a red band at the base.

ERYTHREA. Wings black; upper pair with two red bands; lower ones with six red streaks. Found in Surinam.

ERATO. Wings entire, black; upper pair spotted with yellow and red at the base; lower ones are striate with red. This is found in India.

BELLADONA. Wings entire, black; upper pair with hyaline dots; lower ones with yellow spots.

JULIA. Wings indented, fulvous; upper pair with two black streaks; lower ones black on the hind margin.

HIPPONA. Wings indented, tail varied with yellow and black; lower ones with four white dots. It inhabits India.

Parnassii.

APOLLO. Wings entire, white, spotted with black; lower ones with four eyes above and six beneath. This is a native of many parts of Europe, but has not been observed in these islands. It is something larger than the common great cabbage butterfly. The caterpillar is black, with small red spots, and a pair of short retractile tentacula in front; it feeds on orpine and some other succulent plants, and changes into a brown chrysalis, covered with a kind of violet-coloured powder.

PHOEBUS. Wings entire, both surfaces alike, white, spotted with black; lower ones with three red spots, circled with black. It is found in the wilds of Siberia.

MNEMOSYNE. Wings entire, white, with black nerves; upper pair with two black marginal spots. It inhabits Europe.

* **CRATÆGI.** Wings entire, white, with black veins. This is sometimes called the hawthorn butterfly, and is well known in this country. It is of the size of the common cabbage butterfly, and is seen in the months of June and July.

ANDROMACHIA. Wings entire, both surfaces alike, dotted with black; the upper pair is dusky and naked; the lower ones yellowish. It is found in New Holland.

MANDANE. Wings oblong, entire; the upper pair is hyaline, with black veins; the lower ones black, with a white band. It inhabits Africa.

PIERA. This species has semitransparent wings, with the lower pair marked by two ocellated black spots, with a yellow ring and centre. It is a native of South America.

ANACARDII. Wings entire, hyaline, greenish; lower ones brown at the tip, with two eyes. It is found in America.

NEREIS. Wings scalloped, brown; lower ones with a snowy band, the disk is fulvous, with two black eyes. It inhabits America.

ANDROMEDA. Wings hyaline white; lower ones red at the tip, with a single eye in each. It is found in India.

DIAPHANUS. Wings entire, hyaline, white, the margins brown. It inhabits Jamaica.

HYALINUS. Wings entire, both surfaces alike, upper pair hyaline, with black bands and margin; lower ones testaceous.

OBSCURATUS. Wings testaceous hyaline; upper pair with a yellow band.

IDEA. Semitransparent wings, white, with black spots and veins. It inhabits India.

Eflivi.

PAPILIO.

Festivi.

CYPARISSUS. Wings entire, black, with two white bands, those of the upper pair oblique, of the lower ones punctate. It inhabits America.

MIDAMUS. Wings entire, black, dotted with white; upper pair above blueish; lower ones with a row of white dots. A native of India.

DRYASIS. Wings entire, brown; upper pair with two white dots, all of them with numerous ones beneath. A specimen of this is in the British Museum.

DIOCLETIANUS. Wings entire, black; upper pair with an interrupted white band; lower ones with white lines at the base, and a double row of dots at the tip. A native of the East Indies.

CLAUDIUS. Wings entire, black; upper pair with a blue gloss, and dotted with white; lower ones with white lines. It inhabits Tranquebar.

NAVIUS. Wings entire, black; upper pair with a white band; lower ones with a common white spot at the base. A native of Sierra Leona.

DAMOCLES. Wings entire; upper pair black; lower ones brown with a white disk. It inhabits Asia and Africa.

CORUS. Wings entire, black, all of them with a double row of white dots. A native of India, as is also

TULLIOLUS. Wings entire; upper pair black, with a macular white band; lower ones brown, above immaculate, beneath dotted with white.

SYLVESTER. Wings entire, brown, with a macular white band.

COCHRUS. Wings entire, both surfaces alike, black, with a macular white band; abdomen red, with black belts. In Dr. Hunter's Museum.

LIBERIUS. Wings entire, lead colour, under surface of the upper pair green, of the lower ones fulvous. It inhabits Amboyna.

RADAMANTHUS. Wings entire, black, with a blue gloss; upper pair with a marginal white spot; the lower ones with a white spot and four lines. It is a native of Asia.

ZOILUS. Wings entire, black; upper pair with three white spots, lower ones with a white disk. It is a native of New Holland.

CYNTHEUS. Wings entire, black with testaceous veins, and a white band, which in the upper pair is interrupted. It inhabits Africa.

ARETHEUSUS. Wings entire, black with blue spots; lower ones with red dots beneath. It is found in Surinam.

CLYMENUS. Wings entire, with a blue band; upper pair beneath, fanguneous; lower ones beneath, white with black rings and dots. It is a native of Brazil.

SISAMNUS. Wings entire, black dotted with white and a common white band, which is interrupted in the upper pair.

JASSUS. Wings entire, brown with black streaks; upper pair with a marginal white spot, beneath paler with brown streaks. It inhabits Cayenne.

ANTIOCHUS. Wings entire, black with a common fulvous band above. It is a native of China.

SYPHAX. In this the wings are entire and black; the upper pair has a white band; the lower ones with a marginal red one.

EVALTHE. The wings are entire, black; upper pair with two yellow bands; the lower ones are marked with a yellow band and red spots, beneath red with a yellowish macular band. It is a native of India.

LICAS. Wings entire, brown; upper pair with two white bands; lower ones with a single white band and red spots, beneath cinereous with white bands. It is a native of Surinam.

PHALARIS. The wings of this species are entire and brown; the lower pair with two macular white streaks.

PELASGUS. The wings are entire, both surfaces alike; upper pair greenish with a fulvous band; lower ones immaculate. It inhabits Surinam.

PHICTON. In this the wings are entire, black, with white and rufous spots. It is a native of America.

SOPHUS. The wings are entire; upper pair black, the disk fulvous, spotted with black; the lower ones brown, with a black streak and dots.

GALANTHUS. Wings entire; above black, with sanguineous bands; upper pair with two white dots at the tip.

CENÆUS. Wings entire, brownish; lower ones beneath with a red orb of nine spots. It inhabits India.

CHERMES. Wings entire, dusky; lower ones red, with black bands above, and a snowy dot, in the middle beneath. It is a native of Africa.

HESPERUS. The wings of this are scalloped, brown with black waves, upper pair with white dots.

MIRUS. The wings are scalloped, brown, slightly fasciate with testaceous; lower ones beneath brown at the base, and variegated at the tip.

TYTIUS. Wings entire, brown spotted with white; upper pair with ocellar black dots. It inhabits Surinam.

EUPALUS. The wings are entire, brown; lower ones with a blue band, beneath green, with a black dot. It inhabits Africa.

PINTHEUS. Wings entire, both surfaces alike, brown; upper pair with three yellow spots; lower ones white on the lower half. It is a native of India.

ARCHIPPUS. Wings scalloped, fulvous, with black veins, the margin black, dotted with white; upper pair with fulvous spots at the tip. It is a native of America.

PLEXIPPUS. Wings entire, fulvous, with dilated black veins, the margin black, with white dots; upper pair with a white band at the tip. It inhabits America.

ERIPPUS. Wings entire, dull testaceous, the edge black dotted with white; disk of the lower ones immaculate, beneath with black veins, and white dots. A native of China.

MISIPPUS. The wings of this are scalloped, and fulvous, the edge black, dotted with white, lower ones with a black curve. Found in America.

CHRYSIPPUS. Wings entire, fulvous, the margin black, dotted with white; disk of the lower ones white, with black dots.

ALCIPPUS. Wings entire, fulvous, the margin black, dotted with white; disk of the lower ones white, with black dots. This and the two following are natives of America.

ELEUS. The wings are entire, fulvous; the margin black, of the upper pair with a white band, of the lower ones with white dots.

ERESIMUS. The wings scalloped, testaceous, the tip and margin black dotted with white; lower ones beneath with an obsolete macular whitish band.

DIOCIPPUS. Wings scalloped, fulvous, with a common black border dotted with white; lower ones beneath with three black dots, and a streak of white ones behind. It inhabits India.

GILIPPUS. Wings entire, both surfaces alike, fulvous, spotted with white, the margin black, with white dots. It inhabits America.

HEGESIPPUS. Wings entire, both surfaces alike, black, spotted

PAPILIO.

spotted with white; base of the upper pair fulvous, of the lower ones with white lines.

DARIUS. The wings are entire, brown; upper pair spotted with white, lower ones with a black curve beneath. It inhabits Brazil.

DÆDALUS. Wings entire, brown spotted with white; beneath nut-brown. It is a native of Guinea.

NICÆUS. Wings entire; upper pair with a black eye; lower ones above with a red marginal band and black ocellar spots. It inhabits India.

NUMILIUS. Wings entire, black; upper pair with two fulvous spots, lower ones with a single one. A native of Brazil.

CODOMANNUS. The wings entire, black, with red bands, lower ones beneath with angular yellow lines and blue dots. It inhabits Brazil.

POLYMENUUS. Wings entire, rusty-brown, dotted with black; beneath yellowish, waved with black. It inhabits Surinam.

HYDASPES. Wings entire, brown, with a blue gloss; lower ones beneath yellow, with annular black lines, and three blue dots. A native of Brazil. A specimen is preserved in Sir Joseph Banks' museum.

JAIUS. Wings entire, brown; disk of the lower ones white, with a blue eye above, and two beneath. A native of India.

HAQUINUS. Wings nearly entire, brown; beneath orange, with blueish-silvery spots, marked with black. Found at Tranquebar.

ORION. Wings scalloped; upper pair falcate, rufous, the tip black, with a marginal white spot. Found at Surinam.

COCYTUS. Wings falcate; above black, the hind margin cinereous. It inhabits Siam; and a specimen is in Sir Joseph Banks' museum.

DRUSIUS. Wings entire, fulvous, tip with black; lower ones beneath with white dots and two eyes. This is a native of Rotterdam island.

THYMETUS. Wings entire; yellow, with a common brown border. In the museum of Dr. Hunter.

ABSOLON. Wings fulvous, with brown bands, beneath orange, with brown waves. It inhabits Guinea.

ODIN. Wings entire, dusky, with a single angle; lower ones beneath with a pair of black sub-ocellate dots on each side. It inhabits China.

CELLINE. Wings indented, oblong, fulvous; upper pair with a black lunule. It is a native of America.

DIDO. Wings indented, oblong, black, spotted with green; lower ones with a blueish band, and seven transverse spots. It is a native of America.

EURINOME. Wings indented, black, spotted with white; lower ones white at the base. It inhabits India: so also do the two following.

PHILOMELA. Wings scalloped, black, spotted with white; lower ones radiate, with yellow at the base.

SIMILIS. Wings slightly scalloped, both surfaces alike, with blueish-white dots lineate towards the base.

AFFINIS. Wings indented, black, spotted with white; border of the lower ones beneath black, spotted with yellow and white. A native of New Holland.

LAIUS. Wings indented, black, with blueish stræ, beneath brown. Found in India.

ENOTHIREA. Wings indented, black, with a green disk, beneath black, with a white costal dot. It inhabits Sierra Leona.

DIRTEA. Wings indented, both surfaces alike, black, dotted with yellow. A native of Bengal.

HIPPJA. Wings scalloped, greenish-white, with black border and veins.

PANOPE. Wings indented, brown, both surfaces alike, the outer margin spotted with white, angle of the tail fulvous. This and the next are natives of India.

JACINTHA. Wings scalloped, toothed, brown; upper pair with a streak of white dots; lower ones white at the tip.

MICALIA. Wings falcate, toothed, black, spotted with yellow, middle of the lower ones fulvous, spotted with black. This and the following are natives of America.

PASSIFLOREÆ. Wings indented, fulvous, spotted with black; beneath with thirty silvery spots.

JUNO. Wings angular, indented, oblong, fulvous, with a black border; lower ones beneath black, with fulvous and silvery spots. Found at Surinam.

Danai.

* **BRASSICÆ.** The wings of this insect are rounded, entire, white; tip of the upper pair brown. This is the common large white butterfly known in our gardens: it proceeds from a yellowish caterpillar freckled with blueish and black spots, and which changes during autumn into a yellowish-grey chrysalis, affixed in a perpendicular direction to some wall, tree, or other object, some filaments being drawn across the thorax, in order the more conveniently to secure its position. The fly appears early in the spring, and is seen almost through the summer.

* **RAPÆ.** Wings entire, white; upper pair tipped with brown; male with a brown spot on each, female with three brown spots on the upper, and one on the lower pair. This is common in our own country.

* **NAPI.** Wings entire, with dilated green veins beneath. It inhabits Europe and Asia.

* **SINAPIS.** Wings entire, white; upper pair tipped with brown. This and the three preceding are the insects which in the caterpillar or grub state commit such ravages in our gardens.

NARICA. Wings snowy; upper pair with a brown spot before the tip. It inhabits Guinea.

RAPHANI. Wings entire, white, the tip black, spotted with white; the lower ones beneath with black veins, and covered with yellowish meal.

CASTALIA. Wings entire, white; above immaculate, beneath yellowish at the base. A native of India.

POPPÆA. Wings entire, white; the margin dotted with black; upper pair with a ferruginous spot at the base. It is found at Sierra Leona.

SYLVIA. Wings entire, white; tip of the upper pair brown, with a fulvous spot beneath. Inhabits Sierra Leona. A specimen is in Sir Joseph Banks' museum.

PAULLINA. Wings entire, white, edged with black; lower surface of the upper pair with a yellow spot at the base, of the lower ones immaculate. It is found in India.

ARGANTE. Wings entire, fulvous; beneath speckled with ferruginous. It inhabits Brazil.

MONUSTE. Wings entire, white, edged with brown. Found in America.

AMARYLLIS. Wings entire, both surfaces alike, dull white, upper pair with a black lunule. A native of India.

ARGIA. Wings entire, white; upper pair black at the tip. It inhabits Sierra Leona.

NEPITE. Wings scalloped, white; upper pair with a black dot above, all of them with a brown one beneath. It inhabits China.

AMATHONTE. Wings rounded, white at the tip with black;

PAPILIO.

black; margin of the upper pair beneath nut-brown. Inhabits America.

PHILETA. Wings entire, grey; upper pair above white, tip with brown. It is a native of America.

LIBYTHEA. Wings entire, white; upper pair brown at the base of the rib, and at the tip. Found in India.

CALYPSO. Wings entire, upper pair with a black dot and tip; lower ones beneath yellowish, the margin dotted with black. This is a native of Sierra Leona.

* **DAPLIDICE.** Wings entire, white, with a brown margin, beneath marked with yellowish-white and green. It inhabits Europe and Africa, and is common here.

CNEORA. Wings entire, white, the margin black, with a streak of dots. It inhabits India.

NERISSA. Wings entire, white, with a black margin; beneath with black veins. It is a native of China.

DEMOPHILE. Wings white, with two brown bands and margin; lower ones beneath flesh-colour. It inhabits India.

VANESSA. Wings entire, white; upper pair with a brown exterior margin and black dot; lower ones with brown streaks. It inhabits America.

HECABE. Wings entire, yellow, the outer margin black; beneath dotted with brown. A native of India.

AGAVE. Wings entire, yellow; tip of the upper pair above black; beneath chestnut-brown. It is found at Cayenne.

* **CARDUMINES.** Wings entire, white; upper pair, of the male, with a large bright orange patch at the tip, including two black dots; the lower ones beneath marbled with green; the female is without the orange tip.

GENUTIA. Wings falcate, entire, white; upper pair fulvous at the tip; lower ones marbled with green. It is found in India, as is the next.

DOROTHEA. Wings entire, white; upper pair black at the tip; lower ones beneath with yellow bands, speckled with black.

FLOREA. Wings entire, white; upper pair black at the tip; lower ones with a black spot and marginal dot.

NINA. Wings entire, white; upper pair with a black spot and tip; lower ones beneath speckled with green. This is an Indian insect, but a specimen may be seen in Sir Joseph Banks' museum.

ECHARIS. Wings entire, white; upper pair fulvous at the tip, with a black margin; the lower ones are immaculate. A native of the East Indies.

NYSA. The wings of this species are entire, and white; the lower ones beneath brown, with a white dot and six yellow lunules. It is a native of New Holland. A specimen is in Sir Joseph Banks' museum.

MUTA. Wings entire, white; lower ones with a black dot in the middle, beneath yellow, with two black dots. It is found in many parts of India.

CHLORIS. Wings entire, white, tip with black; lower ones beneath fulvous with a broad black margin. This is an African insect.

RHOPE. Wings entire, white, both surfaces nearly alike; upper pair yellow; lower ones white; all black on the outer margin. It is found in Sierra Leone.

ELATHEA. Wings entire; upper pair yellow; lower ones white; all black on the outer margins; beneath it is cinereous. It inhabits Tranquebar.

ALCMEONE. Wings with both surfaces alike, yellow at the base, and white at the tip. It is found at Tranquebar.

PHRYNE. Wings entire, white, edged with black;

lower ones beneath yellow. It is found in various parts of America.

LICINIA. Wings entire, white, edged with black; lower ones beneath immaculate. It is found in India.

AUROTA. Wings entire, white, the margin black, spotted with white; lower ones beneath yellow. This is a native of Coromandel.

ZELMIRA. Wings white, with a common brown border; upper pair with a white costal band, lower ones with a brown streak beneath. This is found common at Tranquebar.

PYRANTHE. Wings white, with a black dot and tip; beneath with cinereous waves and a fulvous dot. Found on the Cassia in the East Indies.

LEUCIPPE. Wings entire; upper pair red, edged with black; lower ones yellow. It is a native of Amboyna.

GLAUCIPPE. Wings entire, white; upper pair tip with black; lower ones beneath cinereous, with brown waves. It is found in Asia.

CORONIS. Wings entire, with black veins; above white, beneath greenish. It inhabits China.

EUDONIA. Wings entire, white, edged with black; beneath fulvous at the base and spotted with black at the margin. This is found in Sierra Leona.

IPHIGENIA. Wings entire, white, tip with black; the lower ones beneath are yellowish, with a black band in the middle, and an abbreviated fulvous streak. It is found in Surinam.

TEUTONIA. Wings entire, white; lower ones beneath with black veins and yellow spots. It is found in New Holland.

MYISIS. Wings entire, white; margin of the lower ones beneath black with a red band. This is a native of New Holland; and a specimen is in the museum of Sir Joseph Banks.

ARGENTHONA. Wings entire, white, the border black spotted with yellow; the lower ones are yellow, the tip black with a rufous macular band.

NIGRINA. Wings entire, white tip with black; beneath black with a sanguineous flexuous streak on the lower ones. It inhabits New Holland. A specimen is in Sir Joseph Banks' museum.

MARIA. Wings white; upper pair brown with a broad white band. This is found in the East Indies.

SABA. Wings entire, black with a common white band. It inhabits Sierra Leona. Sir Joseph Banks has a specimen.

CORONEA. Wings entire, white edged with black; beneath black radiate with fulvous at the base. Found at Surinam.

MELANIA. Wings entire, white tip with black; lower ones dull glaucous beneath. It inhabits New Holland. There is a specimen in Sir Joseph Banks' museum.

SCYLLA. Wings entire, yellow; upper pair white with a black border; all of them clouded beneath. It is found in the East Indies.

FLIPPANTHA. Wings entire; upper pair white with a black spot and tip; lower ones yellow; beneath nut-brown at the tip.

JUDITH. Wings entire, both surfaces alike; upper pair white with black veins and margin; lower ones fulvous edged with black. This is a native of Poulicandor: a specimen is in Sir Joseph Banks' museum.

AMATA. Wings fulvous, bordered with black, beneath they are greenish. This and the three following are natives of the East Indies.

CYPRÆA.

PAPILIO.

CYPRÆA. Wings entire, fulvous, the margin is black, with fulvous spots; beneath greenish, with a fulvous dot and moniliform streak.

DANAE. Wings white; upper pair saffron at the tip, with a black band and margin; beneath with an abbreviated moniliform streak.

PYRENE. Wings rounded, yellow, with a fulvous spot in the middle, the tip black; lower ones beneath with seven ocellar white spots. It is found in America.

RAHEL. Wings entire, yellow; above edged with black; beneath immaculate. This and the following are natives of India.

MESSALINA. Wings entire, white tipped with black; beneath yellow, with a marginal chefnut-brown spot. It inhabits India.

ÆNIPPE. Wings yellow; underneath they have yellow ocellar brown dots; on the upper pair six; on the lower ones seven. It inhabits China.

EVIPPE. Wings entire, yellowish; upper pair tipped with black; lower ones white beneath. It is found in Asia.

CHARMIONE. Wings entire, both surfaces alike, white with a black border; which on the upper wings has two yellow spots, and one on the lower. A native of Johanna island.

TRITO. Wings entire, yellow; upper pair white above the margin; all of them with a ferruginous streak beneath. It is found in Africa, and also in Europe.

* **EDUSA.** Wings entire, fulvous with a black dot and margin; beneath greenish; upper pair with a black dot; lower with a silvery one. It inhabits Europe.

EUPHENO. Wings entire, yellow; tip of the upper pair black, fulvous in the middle; lower ones with three brown streaks beneath. Found in the southern parts of Europe.

BELIA. Wings entire, white; lower ones subfasciate with grey beneath. It is a native of Barbary.

PHRONIMA. Wings entire, white; base of the rib and tip black; lower ones beneath yellowish, with two darker bands. This and the next are natives of America.

PSAMATHE. Wings entire, white; tip of the upper pair black spotted with white; lower ones beneath greenish with two darker bands, the foremost incurved.

PALÆNO. Wings entire, yellow, with a black tip and fulvous margin; lower ones with a silvery dot beneath. It is found in Europe, as is the next.

* **HYALE.** Wings entire, yellow, the tip black, spotted with white; lower ones with a fulvous spot, a silvery dot with a smaller contiguous one beneath. In the male, the margin of the wings is immaculate; in the female it is spotted.

AURORA. Wings entire, fulvous; upper pair with an ocellar dot beneath; lower ones with a double silvery one. Thought to be a variety of the last.

NICIPPE. Wings entire, fulvous, tipped with brown; upper pair with a black lunule on each side; the lower ones beneath speckled with red. This is found in Virginia.

LESBIA. Wings entire, fulvous; upper pair with a brown dot, all of them beneath pale with a snowy dot. It is found in Patagonia. Sir Joseph Banks has a specimen.

SENNÆ. Wings yellow, each of them beneath with a double ferruginous dot. This is a native of America.

MARCELLINA. Wings entire, yellow; each of them beneath has a double silvery dot. It inhabits Surinam.

EUBULE. Wings entire, yellow, the margin dotted

with black; the lower ones beneath with a double silvery ferruginous dot. A native of Carolina.

CATILLA. Wings yellow; upper pair with a black dot and margin; all of them beneath with a chefnut spot, which on the lower ones contains a double silvery dot. It inhabits Tranquebar.

PROTERPIA. Wings entire, angular, fulvous; upper pair with a black exterior margin. It inhabits Jamaica. There is a specimen in Dr. Hunter's museum.

GNOMA. Wings white; upper pair with a black dot, all of them beneath with a silver dot. Found in India.

DRYA. Wings yellow; lower surface of the upper pair with a ferruginous dot, of the lower ones with a silvery one. It inhabits America.

PHILIPPA. Wings entire, yellow; upper pair acuminate, varied with black, and with a black dot; lower ones with a red dot; all have a silvery one beneath.

* **RHAMNI.** Wings entire, angular, yellow; each with a ferruginous dot in the middle. Inhabits Europe.

PHILEA. Wings entire, angular, yellow; upper pair with a pale spot, lower ones with a pale border. It is a native of India.

CYPRIS. Wings slightly tailed, yellow, the margin dotted with black.

MÆRULA. Wings entire, angular, yellow; upper pair with a black spot and ferruginous one beneath; lower ones with a ferruginous spot on both sides. Inhabits India.

POMONA. Wings subangular, white; upper pair with a black dot; beneath yellow with two silvery dots on the lower ones. A native of New Holland, and is in Sir Joseph Banks' museum.

FLORELLA. Wings subangular, white; upper pair with a brown dot; lower ones beneath with three silvery dots. Native of Africa, and is among Sir J. Banks' collection.

CLEOPATRA. Wings entire; upper pair with a fulvous disk above, and ferruginous dot beneath; lower ones with a ferruginous dot on each side. Found in Europe and Africa.

Nymphales.

JASIUS. Wings two-tailed, brown, yellowish behind; beneath with a white band. Found in different parts of Africa.

PYRRHUS. Wings tailed, brown, with a common white band, reaching half way on the upper pair. It is a native of India.

CAMILLUS. Wings two-tailed, white, with fulvous bands, edged with black; lower ones with a black caudal spot. It is found in Africa, and is in Sir Joseph Banks' museum.

SEMPRONIUS. Wings two-tailed, white, the margin black, dotted with white.

TIRIDATES. Wings indented, two-tailed, above black, spotted with blue; the margin is dotted with white. It inhabits Amboyna.

CASTOR. Wings indented, two-tailed, fulvous, edged with black; beneath with a white band and white spots, including a black one. This and the next are found in Guinea.

POLLUX. Wings indented, two-tailed, brown, with a yellow band; beneath with a white band and spots, including a black one.

ÆCLUS. Wings indented, two-tailed; above black; beneath cinereous, with black waves, and an ocellar fulvous spot. It inhabits Amboyna.

PAULUS. Wings indented, two-tailed, fulvous, tipped with

PAPILIO.

with black; lower ones beneath variegated with a white spot at the base. A native of Jamaica.

ETHEOCLES. Wings two-tailed, blue-brown, with a white band on each side; the lower ones edged with green. It inhabits Sierra Leona.

FABIUS. Wings indented, two-tailed, brown, with yellow bands; the base beneath with black waves; the tip with fulvous dots. It inhabits India, and is in the museum of Sir Joseph Banks.

HORATIUS. Wings indented, two-tailed, black; lower ones fanguineous at the tip, with black ocellar dots.

EUDOXUS. Wings tailed, with a common red band; beneath with silvery spots, including some black ones. It inhabits Africa.

CÆLES. Wings slightly tailed, streaked with white and yellowish, and a white band in the middle; lower ones beneath with a streak of ocellate dots. It is a native of Siam, and is among Sir Joseph Banks' collection.

MILTIADES. Wings tailed, brown; lower ones with a white spot, all beneath with a white band and single eye.

VARANES. Wings tailed, above brown, with fulvous and black spots; the base is white. It is an Indian insect.

THEMISTOCLES. Wings tailed, chestnut-brown, with brown bands; lower ones with black dots.

PERIANDER. Wings tailed, both surfaces alike, white, with yellow bands; the tip brown, streaked with white. It is a native of India, and is in the collection of Sir Joseph Banks.

LYCURGUS. Wings tailed, black, with blue marginal lunules; behind these are five white dots on the lower ones. It is a native of Africa.

DECIUS. Wings tailed, with a common white band; lower ones rufous at the tip, with two eyes and two white dots. It is found in Guinea.

SABINUS. Wings tailed, brown, with a fulvous band; beneath grey, with a white band and ocellar dots. It inhabits Amboyna.

DOREUS. Wings tailed, with a green band above, and a white one beneath. It inhabits Africa, and is in the collection of Sir Joseph Banks.

PALAMEDES. Wings tailed, black, with yellow marginal lunules; upper pair with a yellow band; lower ones with a macular rufous band. It is found in America, and is in the collection of Dr. Hunter.

ORONTES. Wings tailed, black, with two greenish bands; the tail is white and distant. It is a native of India, as is also the next.

ÆGISTUS. Wings tailed, undulate with brown and yellow, and about three caudal eyes.

SOLON. Wings tailed, black, with yellowish bands, brown at the base.

EMPEDOCLES. Wings tailed, brown; upper pair with an abbreviated macular green band; lower ones beneath with two black spots, and a rufous lunule at the angle of the tail. It is a native of India, and in the collection of Sir Joseph Banks.

EURYALUS. Wings tailed, black; lower ones blue before the margin, with black spots, including a white pupil. It inhabits Amboyna, as does the next.

NISUS. Wings tailed, black; upper pair with a fulvous band; lower pair with a submarginal white one.

PHIDIPPUS. Wings slightly tailed, brown; beneath with white biocellate bands, and two blind eyes at the tail. It inhabits India.

XIPHARES. Wings indented, tailed, black; upper pair

with white spots; lower ones with a yellow band. Found in Africa.

AURELIUS. Wings slightly tailed, brown; the tip black, spotted with white; lower ones with two eyes beneath. It inhabits India.

BERNARDUS. Wings tailed, fulvous; upper pair black at the tip, with a yellow band; lower ones with a streak of ocellate dots. It is found in China.

GERDRATUS. Wings tailed, brown; upper pair with an ocellate spot at the tip, beneath ferruginous, with a white dot on the upper, and two on the lower ones.

CHORINÆUS. Wings tailed, brown; upper pair falcate, with a fulvous band. It inhabits Surinam.

LAERTES. Wings tailed, brown, blue at the base; lower ones above with five white dots, beneath with four ocellar dots. Found in Surinam.

MORVUS. Wings tailed, above brown, with a blue base; beneath greenish-grey. A native of India, as are the two following.

OCTAVIUS. Wings tailed, black, with an abbreviated green band; beneath grey, with a brown streak.

ERIBOTES. Wings slightly tailed, fulvous, with a blueish base; beneath grey.

ITYS. Wings slightly tailed, fulvous, tipped with yellow; beneath variegated at the base; the lower ones are blue at the base. This and the two following are inhabitants of Surinam.

CYMODOCE. Wings slightly tailed, brown, the base shining blue; lower ones with a single eye on each side.

BASALTIDE. Wings slightly tailed, fulvous, tipped with black; under surface of the upper pair with two ocellate dots, of the under ones with three.

ARSINOË. Wings indented, tailed, fulvous, spotted with black; lower ones with two eyes beneath. It inhabits Amboyna.

PANTHERA. Wings indented, tailed, brown, beneath waved; lower ones with two eyes on the disk, and five blueish ones on the margin. It inhabits Tranquebar.

ROHRIA. Wings indented, tailed, brown; upper pair with a white band; lower ones with seven eyes beneath, most of them dotted with white. It inhabits India.

REBECCA. Wings indented, tailed, brown, immaculate; beneath paler, with two nut-brown streaks and white sub-ocellar dots. Found in Guinea.

EROTA. Wings slightly tailed, brown, with black waves, and a common white band in the middle; lower ones with two eyes on each side. A native of Africa.

EUROPA. Wings slightly tailed, brown; lower ones beneath with a whitish ocellar band. Found in America.

ACHERONTA. Wings indented, tailed; upper pair red at the base; the tip is black, spotted with white. It inhabits Brazil.

TROGLODYTA. Wings indented, tailed, rufous, with a brown streak and hind margin. It inhabits America, and is in the collection of Dr. Hunter.

THETYS. Wings indented, tailed, fulvous, with black streaks; lower ones beneath glaucous, dotted with black. It inhabits South America.

PORTIA. Wings indented, tailed; beneath grey, speckled with black. It inhabits the South American islands.

C. AUREUM. Wings indented, tailed, fulvous, spotted with black; lower ones marked with a gold C beneath. It is found in Asia.

ISIDORE. Wings falcate, tailed, fulvous; upper pair with two pale dots in the middle, and black at the tip. It is found in India.

BELLA.

PAPILIO.

- BELLA.** Wings slightly tailed, testaceous; upper pair black at the tip, with a yellow band and white spots; margin of the lower ones yellow, with black streaks. This and the six following species are all inhabitants of India.
- FURCULA.** Wings tailed, brown, fulvous at the base; upper pair with a blue band.
- EUROCILIA.** Wings indented, tailed, brown, with a common fulvous disk; lower ones variegated beneath.
- PHORCYS.** Wings slightly tailed, indented, brown; beneath with darker streaks, and two cinereous dots on the lower ones.
- CHIELYS.** Wings indented, tailed, brown; beneath variegated, with a streak of yellowish dots.
- LETHE.** Wings indented, tailed, fulvous; upper pair black at the tip, with a yellow band and spots.
- AFLINA.** Wings tailed, brown, with a common fulvous disk; upper pair with a black lunule. It inhabits St. Thomas's island.
- FATIMA.** Wings slightly tailed, black, with a common yellow band; lower wings with the band abbreviated, and four rufous spots. It is found in India.
- ACHILLES.** Wings indented, black, with a broad blue band; beneath brown, with three or five eyes. Found in America.
- MEDON.** Wings above black; upper pair with a yellow band, and white at the tip; lower ones with a blueish disk. It is found in India.
- ERITHRONIUS.** Wings indented, black; lower ones with a blue band; beneath green, with a streak of white dots. It inhabits Africa, and is in the museum of Dr. Hunter.
- CERES.** Wings indented, black; upper pair with a white band; disk of the lower ones blueish, with a black dot. It inhabits Sierra Leona.
- URSULA.** Wings indented, black; hind ones with a blueish border, and marginal black band; beneath they are marked with fulvous spots. It is a native of America.
- CATO.** Wings indented, black, with a common greenish disk beneath, dotted with black, with a rufous spot at the base of the lower ones. It inhabits Sierra Leona.
- PHILOCTETES.** Wings indented, brown; lower ones with two eyes, the pupil black, and three white dots. It is found in India, as is the next.
- MENETHO.** Wings indented, brown, the margin spotted with yellow; the lower ones have three eyes beneath.
- LUCRETIUS.** Wings indented, black, with fulvous bands; beneath with black spots, surrounded with a blue line. Found in Guinea.
- EPISTROPHIUS.** Wings indented, grey-white; upper pair black at the tip; lower ones with a streak of yellow eyes beneath. It is a native of America.
- HELENES.** Wings indented, brown, with two greenish bands; one on the lower wings entire. It inhabits America.
- GAMBRICIUS.** Wings indented, above black spotted, and streaked with green; upper pair with a macular snowy band. A native of India.
- DEMOPHON.** Wings indented, above black, with a green band; beneath grey, streaked with white. Inhabits Cayenne.
- NESTOR.** Wings indented, brown, with a bright blue common disk, and white spots; beneath with three or four eyes. This species inhabits America.
- PERSEUS.** Wings indented, pale blue, the tip black, with ferruginous spots; beneath they are waved with three or four eyes. Inhabits Surinam.
- ARISTIDES.** Wings indented, brown, spotted with yellow; lower ones with two eyes beneath. Found in India.
- TELEMACHIUS.** Wings indented, brown, with a common blue radiate area, each with eyes beneath. A native of America, as are the two following.
- MENELAUS.** Wings indented, above highly polished, blue; beneath clouded brown, with ferruginous eyes.
- TEUCER.** Wings scalloped, livid brown; beneath clouded, and on the lower ones three eyes, the last very large.
- AUTOMEDON.** Wings angular, scalloped, brown; beneath livid, with an eye at the angle of the tail. Inhabits Surinam.
- HECUBA.** Wings indented; upper pair red, edged with black; lower ones black; all of them ocellate beneath. It inhabits Cayenne.
- METELLUS.** Wings indented, fulvous, the hind part black; under surface of the upper pair with three eyes, of the lower ones five. This is a native of Surinam.
- IDOMEUS.** Wings indented, blue; upper pair with a broad brown upper margin, and abbreviated white band; lower ones with a large yellowish eye beneath. Inhabits America.
- * **Io; Peacock Butterfly,** so called on account of its great beauty. It is rather a common species in this country. The wings are angular, indented, fulvous, spotted with black, and on each there is a large blue eye. "The ground colour of this insect," says Dr. Shaw, "is orange-brown, with black bars, separated by yellow intermediate spaces, on the upper edge of the superior wings; while at the tip of each is a most beautiful large eye-shaped spot, formed by a combination of black, brown, and blue, with the addition of whitish specks; on each of the lower wings is a still larger eye-shaped spot, consisting of a black central patch, varied with blue, and surrounded by a zone of pale brown, which is itself deeply bordered with black. The caterpillar is black, with numerous white spots, and black ramified spines: it feeds principally on the nettle, changing to a chrysalis in July, and the fly appearing in August."
- POLYNICE.** Wings angular, indented, fulvous, tipped with black; beneath brown, with blue streaks and eyes, six on the upper, and five on the lower ones. A native of Sumatra.
- ALMANA.** Wings angular, fulvous, spotted with black; lower ones with a larger eye, and a double pupil, all nut-brown beneath. It inhabits Asia.
- ASTERIE.** Wings indented, varied with yellow; lower ones with a larger eye and double pupil; beneath pale, with about three eyes. This inhabits India.
- OENONE.** Wings denticulate, yellow, edged with black; lower ones blue at the base. This is an Asiatic insect.
- FLIRTEA.** Wings subangular, brown, with fulvous spots, and two eyes; lower ones beneath ferruginous, with about three eyes. This and the next are found in India.
- LEMONIAS.** Wings indented, brown, dotted with yellow, all of them with a single eye.
- VELLIDA.** Wings indented, brown, with a fulvous band behind, and two eyes. It inhabits Amsterdam island. A specimen is in Sir Joseph Banks' museum.
- ORYTHIA.** Wings indented, brown; all with two eyes above, upper pair with a single eye beneath. This inhabits Jamaica.
- CLELIA.** Wings indented, black; upper pair with an interrupted white band and spot at the tip; lower ones with a blue spot on the disk. It is a native of Guinea.
- PENLEA.** Wings indented, above brown; all with two eyes beneath. A native of Surinam.

PAPILIO.

ZELMA. Wings angular, yellow, subfasciate with brown; lower ones with six eyes on each side, and a white streak beneath. It inhabits New Holland, and is in Sir Joseph Banks' collection.

TEREA. Wings angular, indented, above brown, with a fulvous band and streak of white dots on the upper pair, and of ocellate ones on the lower. A native of Sierra Leona.

LAODICE. Wings angular, above black with a greenish band on each side, including a streak of ocellar dots. Found in Guinea.

LAMPETIA. Wings indented, brown; upper pair with a fulvous band; lower ones with six blind eyes. This and the next are natives of India.

GLYCERIE. Wings indented, brown; upper pair with a fulvous band, under surfaces of the upper pair with one, of the lower with two blind eyes.

* **MEGERA.** Wings indented, yellowish-brown with dark bands; upper pair with a single eye; lower ones with five eyes above, and six beneath. This is found in our own country, and has been described and figured by Mr. Donovan.

ÆGERIA. Wings indented, brown, spotted with yellow, upper pair with an eye on each side; lower ones with four eyes above, and dots beneath. This belongs to England, and is described in Lewin's butterflies.

XIPHIA. Wings indented, brown, spotted with yellow; upper pair with an eye on each side; lower ones with three eyes above and four beneath. Found in the island of Madeira, and is in the collection of Sir Joseph Banks.

MINERVA. Wings indented, fulvous, the tip black, spotted with white; lower ones with five blind eyes above, and seven pupillate ones beneath. It is a native of America.

OCYPETE. Wings indented; above brown, immaculate; beneath glaucous, with three dark streaks; lower ones with five eyes. It inhabits Surinam.

OCIRRHŒ. Wings indented; above white tipped with brown; beneath brown with two white bands; lower ones with five eyes. A native of Surinam.

PENELOPE. Wings slightly indented, brown, with a single eye; lower ones with two beneath. It is found in Surinam.

ARANEA. Wings slightly indented, brown; lower ones blueish with five eyes beneath. This is found in Surinam.

ATLITA. Wings indented, brown with a blue gloss; beneath fulvous, with waved glaucous streaks, and five blind eyes on the lower ones. It is middle-sized, and a native of the East Indies.

JATROPHÆ. Wings angular, pale with waved brown streaks; upper pair with a single eye, lower ones with two. This is a native of America.

LAOMEDIA. Wings indented, grey; upper pair with five eyes; lower ones with five, some of them are blind. It inhabits India, as does the next also.

LIBYA. Wings indented, brown; beneath lineate, with six eyes on the lower ones, the pupil silvery.

HEDONIA. Wings indented, both sides alike, grey; each with six ferruginous eyes. An Asiatic insect.

TULLIA. Wings indented, brown, with ocellar spots, beneath with a violet band, which on the lower ones has two eyes. It inhabits China.

MEROPE. Wings indented, fulvous, with a single eye, and black tip; lower ones beneath cinereous with three mi-

nute eyes. It inhabits New Holland, a specimen of it is in the museum of Sir Joseph Banks.

JOLE. Wings indented, fulvous, dotted with black; lower ones with five eyes beneath, the last with a double pupil. It inhabits Guinea.

HESIONE. Wings indented, brown, with an oblique white streak beneath; upper pair with two eyes; lower ones including others within them. It inhabits Surinam.

EGÆA. Wings indented, above black, with a common white band; lower ones with two eyes beneath. This and the two following inhabit America. Dr. Hunter's museum contains a specimen.

SERINA. Wings slightly indented, above green; lower ones beneath with a white disk and two eyes.

POSTUERTA. Wings indented, green with brown spots and margin; lower ones beneath with white bands, and two eyes.

MYLITTA. Wings indented, black, with three macular white bands, lower ones with two eyes. A native of India.

ARTEMISIA. Wings indented, black; upper pair with white spots, lower ones with white bands, and two silvery eyes beneath. It inhabits America.

DORIMENE. Wings indented, brown; beneath blue with black bands, and three pair of eyes. This inhabits Surinam.

JANTHE. Wings indented, above brown, slightly barred with white, lower ones with five blind eyes. It inhabits Cayenne.

LAOTHOE. Wings angular, indented; lower ones above brown, with a white dot, and six blue eyes. This is a native of Surinam.

GENERILLA. Wings indented, black, spotted with white, and a common rufous band; lower ones with four eyes. This is an inhabitant of New Zealand.

ITEA. Wings indented, black; upper pair with a yellow band and dot; disk of the lower ones rufous, with four eyes. It inhabits New Zealand, and is thought to be a variety of the last.

PORTLANDIA. Wings indented, brown; lower ones with five blind eyes above, and seven pupillate ones beneath. It is a native of America.

* **CARDUI.** Wings indented, fulvous, variegated with white and black; the lower ones have four eyes beneath. This is an English insect, and is described by Mr. Donovan.

HUNTERA. Wings subangular, fulvous, varied with white and black; lower ones beneath reticulate with white, and with two eyes.

ALLIONA. Wings indented, brown; upper pair with two eyes, the posterior one blind. Inhabits Portugal.

TULBAGHIA. Wings indented, both surfaces nearly alike, brownish, with a yellow band; lower ones with five eyes. It inhabits the Cape of Good Hope.

PIPLEIS. Wings crenate, both surfaces alike, black; disk of the lower ones fulvous, with seven eyes. It inhabits India, as does the next.

CLAUDIA. Wings crenate, black, with a sanguineous patch; lower ones fulvous with seven eyes.

BLOMFILDIS. Wings indented, yellow, tipped with black; lower ones beneath brown, waved with white, with four eyes, the middle ones blind. It inhabits Brazil. Specimens of this and the two next are in the museum of Sir Joseph Banks.

BANKIA. Wings angular, above brown; disk of the upper pair yellowish, with a black eye, in which is a double pupil. It inhabits New Holland.

PAPILIO.

SOLANDRA. Wings angular, brown; upper pair with an eye, and also a contiguous one that is smaller; lower ones with two above, and four beneath. It inhabits Orabeite.

POLYDECTA. Wings indented, brown; upper pair with an eye; lower ones with two above and seven beneath. It inhabits Tranquebar.

TOLUMNIA. Wings indented, black; lower ones beneath with ferruginous and blue streaks and five eyes, the posterior one very large. This and the next inhabit India.

MORNA. Wings indented, brown; lower ones with two eyes on each side, and three white dots. A specimen may be seen in Dr. Hunter's museum.

JULIANA. Wings indented, brown, spotted with white; lower ones with two eyes on each side. This is a native of Amboyna.

LEDA. Wings angular, brown, upper pair with a double eye above; beneath reticulate with grey, and six eyes on the lower ones. It inhabits Sierra Leona.

LENA. Wings slightly indented, brown; lower ones black behind, with white and blue dots, and eyes beneath. There is a variety with brown hyaline wings, the lower ones with five ocellar white spots. It is found at Cayenne.

DYNDIMENE. Wings indented, brown; lower ones above violet, with four white dots. It inhabits Surinam.

LUNA. Wings indented, brown, with darker streaks; lower ones with two eyes, and they all have underneath four white dots.

IPHITA. Wings angular, indented, brown, with darker bands; all with five eyes beneath. It inhabits China.

CALLISTO. Wings indented, black; lower ones with a red band, and five eyes above, seven beneath. This is an African insect.

* **IRIS.** Wings indented, brown, with a blue gloss, and whitish interrupted band on each side; all with a single eye, those on the upper pair above blind. This is described and figured by Donovan and Lewin.

ILIA. Wings indented, with a blue gloss, and interrupted white band on each side; they have all a single eye. It inhabits Germany, and is probably a variety of the former.

BEROE. Wings entire, brown, with a blue gloss; lower ones with a single eye; beneath chestnut-brown with reddish margin. It inhabits Austria.

AVIA. Wings indented, both surfaces nearly alike, black, with a streak of pale dots, and a macular pale marginal band. It inhabits Africa.

POPULI. Wings indented, brown, with white bands and spots; beneath yellow, with white bands and blueish spots. This is an European insect.

CHRYSIPPE. Wings indented, black, with a common rufous patch; lower ones beneath brown, spotted with black. This is a native of New Holland, and is preserved in Sir Joseph Banks' collection.

CYDIPPE. Wings indented, black, with white spots, and a common rufous patch; the base beneath is testaceous, varied with black and blue. A native of India.

MARICA. Wings indented, testaceous, the tip black, with a white band on the upper, and blue spots on the lower pair. It inhabits Africa.

ALTHEA. Wings indented, brown, with an angular indented white band and streak. It inhabits Guinea.

AMPHICEDA. Wings indented, brown, the common disk cinereous, with brown waves; beneath grey at the tip with black lunules. It inhabits Guinea.

PENTHESILIA. Wings indented, black, with white spots, and a common rufous patch; lower ones beneath with yellow

bands, and a white one spotted with black. It is a native of India.

BERENICE. Wings indented, black, with a common red band; lower ones beneath spotted with black, white, ferruginous and yellow. This and the next inhabit Sierra Leona.

SEMIRE. Wings indented, both surfaces nearly alike, with a green band, and fulvous spots, the base fulvous, dotted with black.

CYANE. Wings indented, black; upper pair with a white band; disk of the lower ones white, dotted with black. Found in India.

VITILLIA. Wings indented, black; beneath spotted with white. This species inhabits Amboyna.

ZENOBIA. Wings indented, black, with a common white band, and marginal spots; base of the lower ones beneath yellow, streaked with black. It inhabits Sierra Leona.

* **ANTIOPA.** Wings angular, indented, black-brown, with a whitish border, behind which is a row of blue spots.

CACTA. Wings angular, indented, upper pair black, the base purple, with a fulvous spot. It inhabits India.

PYTHIA. Wings angular, indented, brown with a white spot on the upper pair; beneath grey, with a streak of black dots on the lower ones. It inhabits Guinea.

ZINGHA. Wings angular, indented, brown, the tip black, with blue streaks, and a macular fulvous one. It inhabits Sierra Leona.

PROTOGENIA. Wings indented, fulvous, the border black spotted with white. It inhabits Java.

AMESTRIS. Wings angular, indented, black with rufous and blue lunules, beneath darker. It inhabits India, as does the next also.

LAMINA. Wings angular, black with a common white band on each side, beneath spotted with rufous.

* **ATALANTA.** Wings indented, black; upper pair with a red band and white spots, the lower ones bordered with red behind. This, as the admirable butterfly, has been described and figured by Donovan, Lewin, and Dr. Shaw; the latter says "it is of the most intense velvet-black colour, with a rich carmine-coloured bar across the upper wings, which are spotted towards the tips with white; while the lower wings are black, with a deep border of carmine colour, marked by a row of small black spots; the under surface of the wings also presents a most beautiful mixture of colours; the caterpillar is brown and spiny, feeds on nettles, and changes into a chrysalis in July, the fly appearing in August."

ARCHESIA. Wings indented, brown with a common fulvous band, which on the upper pair is half blue. It is a native of Java.

CIARONIA. Wings indented, black, with a blueish band. It inhabits India.

BIBLIS. Wings indented, both surfaces alike, black; lower ones with a macular red band. It inhabits America.

HYPERIA. Wings indented, black spotted with white; lower ones beneath with yellow spots, and a rufous band in the middle. Inhabits India. A specimen is in the British Museum.

PROSOPE. Wings indented, brown with a common fulvous band, which on the upper pair has two black dots. It inhabits New Holland, and is in the museum of Sir J. Banks.

ECHIO. Wings indented, brown, all beneath with a row of white dots. It inhabits Surinam.

OCTAVIA. Wings indented, brown, the disk angular, fulvous,

PAPILIO.

fulvous, dotted with black, beneath with yellow spots at the base. This is a native of Sierra Leona.

LUBENTINA. Wings indented, obscure green, spotted with white, black, and rufous. Found in China.

JANASSIA. Wings scalloped, green, bronzed, with black dots on the upper pair; beneath yellowish, with black dots at the base.

* **POLYCHLORIS.** Wings indented, fulvous, spotted with black; upper pair with four black dots above. This is found in England, and divers parts of Europe.

V. ALBUM. Wings angular, fulvous, spotted with black; all with a white spot above; lower ones with a white lunule beneath. Found in several parts of Europe.

* **URTICÆ.** Wings angular, fulvous, spotted with black; upper pair with three black dots, the inner one square. It inhabits this country, and has been described and figured by Donovan and Lewin. The larva is spinous, varied with brown and green, head black; pupa toothed, brown, with gold dots. This insect and many others of the same genus, as the *Atalanta*, *Polychloris*, *Io*, &c. soon after their enlargement from the chrysalis state, discharge a few drops of reddish coloured fluid, which, in places where they have appeared in large numbers, has had the appearance of a shower of blood, and having of course been greatly magnified, the fact has been recorded by writers as a prodigy ominous of some extraordinary event.

CLYTEMNESTRA. Wings angular, black; beneath spotted with white; upper pair with a yellow band on each side. Inhabits Surinam.

DIRCE. Wings angular, brown; upper pair with a yellowish band, beneath undulate with black. Found in various parts of India; as are the two following.

ISIS. Wings indented; upper pair black, with a red spot on the disk; all of them with green lines beneath.

OISIS. Wings angular, blue; upper pair with a black spot and margin; beneath dusky.

PROGNE. Wings indented, fulvous, with black dots and margin, the latter dotted with white; beneath grey. Found in South America.

* **C. ALBUM.** Wings angular, fulvous, spotted with black; lower ones beneath marked with a white C. This is found in England, and other European countries.

TRIANGULUM. Wings angular, fulvous, the disk dotted with black; lower ones beneath cinereous with white waves, and a white angle in the middle. It is a native of Italy.

MERIONE. Wings indented, fulvous, edged with brown; lower ones beneath brown, with white and blue spots and streaks. It inhabits Surinam.

ARIADNE. Wings angular, fulvous, with undulate black streaks; upper pair with a white marginal dot. Found in the island of Java.

BOLINA. Wings indented, black; upper pair with two, lower ones a single blue-white spot; beneath ferruginous, with a white band. Found in the East Indies.

THECLA. Wings indented, black, with a white-blue spot, all of them have a streak of white dots; beneath brown, with a white band. Found in India.

LASINASSA. Wings indented, black, with a shining blue spot; beneath brown, with white lunules. It inhabits Asia.

CLYTIA. Wings indented, black; outer margin of the upper pair spotted with white; lower ones with a triple row of white and yellow spots. This and the next are natives of India.

COCYTA. Wings scalloped, indented, brown; lower ones blueish at the tip. It inhabits India.

UNDULARIS. Wings indented, above brown; lower ones

ferruginous at the tip, with a white dot beneath. It inhabits Coromandel.

MONIMA. Wings indented, brown; lower ones pale chestnut, blueish at the angle of the tail, with a black streak. It inhabits the East Indies.

HIARBA. Wings indented, black, with a common white band, which is abbreviated on the upper pair. It inhabits India.

AMATHEA. Wings angular, indented; above brown, with white dots, a red band, and waved black line. It inhabits Cayenne.

MELEAGRIS. Wings slightly indented, dotted with white, above brown, beneath yellowish. It inhabits Africa.

MELANTHA. Wings indented, above brown, dotted with white, beneath pale chestnut. It inhabits Guinea. A specimen is to be seen in Sir J. Banks' museum.

LEUCOTHOE. Wings indented, above brown, with three white bands; beneath yellow, with three white bands marked with black. It is found in divers parts of Asia.

MEDEA. Wings indented, falcate, black, with three macular yellow bands; angle at the tail red. A native of Surinam.

BLANDINA. Wings indented, above brown, beneath yellow, with two blue streaks, and dots marked with black on the lower ones. This and the next are found in Sierra Leona.

HOSTILIA. Wings indented, brown; the base fulvous dotted with black; upper pair spotted with yellow at the tip.

NAUPLIA. Wings slightly indented, both surfaces nearly alike, black; upper pair with four white spots above, lower ones with a white band. It inhabits South America.

HELIODORE. Wings indented, fulvous, with three black bands. It is found at Siam, and may be seen in the museum of Sir Joseph Banks.

OPHIONE. Wings indented, brown spotted with white; beneath with numerous black ocellar spots. It inhabits Guinea.

ILITHURIA. Wings indented, fulvous, with black bands; lower ones beneath with white bands, spotted with black. It inhabits India.

AMPHIONE. Wings indented, black, clouded with blue; upper pair with a white band on each side; lower ones beneath radiate with red. It inhabits South America.

OPIS. Wings indented, brown; upper pair reticulate, lower ones barred with yellow. This and the next are found at Sierra Leona.

CRITHEA. Wings indented, brown, with ocellar spots; lower ones beneath cinereous, with two brown spots and a streak.

PHEGEA. Wings indented, brown; upper pair with a ferruginous or white band; disk of the lower ones ferruginous or white; beneath paler, waved with black. It is found in India.

SALMASIS. Wings indented, black, radiate with blue; beneath brown, with a white band. It inhabits Africa.

PELEA. Wings indented, black; upper pair with arrow-shaped white and black spots; beneath cinereous, with black lunules. It is a native of the East Indies.

NERINA. Wings indented, black, with a white band, which on the upper pair ends in a rufous spot. It inhabits New Holland, and may be seen at Sir J. Banks.

VENILIA. Wings indented, brown, with a common white curved band, blueish at the edges. This and the three following are natives of India.

ALCMENA. Wings indented, black, with an interrupted blue band, each with seven white marginal dots.

PAPILIO.

PHERUSA. Wings indented, fulvous, with three brown bands, those on the upper pair longitudinal, on the lower ones transverse.

AGATHA. Wings indented, above fulvous, beneath glaucous, lower ones with one black dot above, and three beneath.

LAURA. Wings angular, indented, brown, with a common band, which is fulvous on the upper half, and snowy on the lower; lower ones beneath silvery with a snowy band. It inhabits Jamaica.

LYDIA. Wings indented, yellow, black above the margin; beneath with a streak of black dots. It inhabits Surinam.

IPHICLA. Wings indented, above brown, with a common white ferruginous spot at the angle of the tail. Found in South America.

LIBERIA. Wings indented, fulvous; upper pair with a black curve at the tip; lower ones with a black dot above, and three ocellar ones beneath. It inhabits India.

AMASIA. Wings indented, green; lower pair with marginal black dots above, and eyes beneath. Found at Surinam.

ÆTHIOPIA. Wings indented, blue; tip of the upper pair black, dotted with white. A native of Africa.

VERONICA. Wings indented, above greenish, beneath ferruginous, with a paler band. It is found in Guinea.

GNIDIA. Wings indented, testaceous, upper pair brown at the tip, with a white band; lower ones with a fulvous streak and black lunules. It is found in India.

PERSEA. Wings indented, oblong, black, spotted with yellow, and with a common red disk. It inhabits India.

NÆRREA. Wings indented, above brown, spotted with white beneath, with white spots surrounded with a red line. There is a variety of this species, wings slightly tailed, black; upper pair with two red spots, disk of the lower ones edged with red. Natives of India.

PROCRIS. Wings indented, fulvous, with black spots and a white band, beneath variegated. Inhabits China.

MAJA. Wings indented, brown; upper pair spotted with white, lower ones immaculate. It is found in Brasil.

ERYMANTHIS. Wings indented, fulvous; upper pair black at the tip, with a yellow band; lower ones with black lunules above, and a streak of ocellate dots beneath. Inhabits China.

CARIMENTA. Wings falcate, indented, brown, spotted with yellow; upper pair black at the tip, with four white spots. Found in Surinam.

MARTHA. Wings indented, varied with brown and fulvous; upper pair with three rows of white lunules; lower ones with a white band. It is found in Siam, and a specimen is in Sir Joseph Banks' museum.

CELTIS. Wings angular, indented, brown, with fulvous spots, and a single white one; lower ones beneath grey. Found in Southern Europe.

F. ALBUM. Wings angular, indented, fulvous, spotted with brown; lower ones with a snowy line beneath. It is found in Russia.

HARPYJA. Wings falcate, indented, brown, with a common blueish band, dotted with black.

MELISSA. Wings indented, brown; lower ones beneath marbled with grey. It is found in America.

ELEA. Wings indented, brown; upper pair with a fulvous band, lower ones with a white one. Found in India.

MESENTERIA. Wings indented, brown; upper pair with a fulvous band above, and blue central spots beneath. Inhabits Surinam.

NIPHE. Wings indented, yellow; tip of the upper pair

black, with a white band; lower ones beneath silvery with five eyes. It inhabits China. There is a variety, of which the wings above are fulvous, spotted with black, without the black tip and white band.

THYELIA. Wings indented, fulvous, spotted with black; lower ones beneath, with a white band and two scarlet dots at the base. It is a native of India.

PAPHIA. This is a highly elegant insect, of a fine orange-chestnut colour above, with numerous black spots and bars; beneath greenish, with narrow silvery undulations on the lower wings, and black spots on the upper. It proceeds from a yellowish-brown spiny caterpillar, living principally on nettles. This insect is generally found in the neighbourhood of woods. There is a variety cinereous, spotted with black, peculiar to Russia.

CYNARA. Wings indented, green spotted with black; lower ones beneath green, with three silvery spots and two bands. An inhabitant of the East.

CETHOSIA. Wings indented, fulvous, spotted with black; lower ones beneath brown at the tip, with a glaucous gloss, and ending in an interrupted silvery band. It inhabits Russia.

CYTHEREA. Wings crenate, brown; upper pair with a fulvous band; lower ones with a common silvery one; beneath with a lanceolate silvery band. It is found in India.

* **AGLAJA.** Wings indented, fulvous, spotted with black; beneath it has twenty-one silvery spots. This is found in England and other parts of Europe.

APHRODITE. Wings indented, fulvous, spotted with black; lower ones beneath brown, with twenty-four silvery spots. A native of South America.

MYRINA. Wings indented, fulvous, spotted with black; beneath with thirty silvery spots. It inhabits North America, as do the two following.

CYBELE. Wings indented, fulvous, spotted with black; beneath thirty-four silvery spots.

IDALIA. Wings indented, fulvous, spotted with black; beneath with thirty-seven silvery spots.

DIANA. Wings indented, brown, with a common black disk; lower ones beneath with nine silvery spots.

* **ADIPPE.** Wings indented, fulvous, spotted with black; beneath there are twenty-eight silvery spots. This is an English insect.

* **LATHONIA.** Wings slightly indented, pale, fulvous, spotted with black; beneath with thirty-seven silvery spots. This and the next, like the last, are English insects.

* **EUPHYROSYNE.** Wings indented, pale, fulvous, spotted with black; beneath with nine silvery spots.

SELENE. Wings indented, fulvous, with black; lower ones beneath, with twelve silvery spots; a distinct black dot at the base and streak behind. This is found at Kiel.

NIobe. Wings indented, fulvous, spotted with black; beneath with pale spots, and three silvery ocellate ones. Found in various parts of Europe.

COLUMBINA. Wings indented, fulvous, spotted with black; lower ones beneath with two silvery streaks. It is found in America, as is the next.

BELLONA. Wings indented, fulvous, spotted with black; lower ones beneath silvery at the tip, with six ocellar spots.

PHALANTA. Wings indented, fulvous, spotted with black; lower ones beneath; glaucous at the tip, with three fulvous ocellar spots. Found in the East Indies.

THAIS. Wings indented, fulvous, the margin streaked with black; beneath glaucous; lower ones with a silvery band and ocellar dots. Native of America.

GRIPUS. Wings entire, brownish; beneath a streak of white dots. It is found in India.

POSTHUMOUS.

PAPILIO.

POSTHUMOUS. Wings falcate, entire, brown, with a blue disk; lower ones beneath grey immaculate.

SOPHORÆ. Wings entire, brown, with a ferruginous band; lower ones beneath chestnut-brown, with two eyes. It inhabits America.

XANTHUS. Wings entire, brown, with a ferruginous band; lower ones beneath marbled with grey and two eyes. It inhabits Asia.

CASSIÆ. Wings scalloped, brown, with a ferruginous band, bifid at the tip; lower ones beneath cinereous, with two eyes. It inhabits America.

BEIRECYNTHUS. Wings entire, above black, with a marginal yellow band; lower ones beneath with six ocellar spots. Found at Surinam.

ARCADIUS. Wings entire; upper pair black, spotted with blue and white; lower ones brown; beneath chestnut-brown. It inhabits Africa.

HONORIUS. Wings entire, blue; upper pair black at the tip, with a brown rib; lower ones dotted, with black at the base and striate at the tip.

OETHON. Wings entire, brown, with a fulvous marginal streak; lower ones beneath, nearly naked, with seven eyes. Found at Surinam.

POLIXENES. Wings entire, brown; lower ones beneath clouded with brown and grey. It inhabits North America, and is in the museum of Sir Joseph Banks.

CAPAVIUS. Wings entire, black, spotted with white; lower ones beneath grey, with a white band on each side. It is found on the Guinea coast of Africa.

CONSTANTIUS. Wings entire, dull, cinereous, with a marginal streak of brown dots.

MARTHESIUS. Wings entire, black; upper pair with a fulvous disk; lower ones with a streak of white dots. It is a native of Surinam.

ARCESILAUS. Wings entire, above ferruginous, immaculate, beneath brown, with two darker streaks. It is found in Siam; a specimen is preserved in Sir Joseph Banks' museum.

NERO. Wings entire, fanguineous, with a brownish margin; lower ones orange beneath. This is a native of Asia. It is in the British Museum.

POLYCARMES. Wings entire, above black, beneath chestnut-brown, immaculate. This is found in Surinam.

ÆROPIUS. Wings entire, brown with a yellow band; upper pair beneath, with a single eye at the base. It inhabits India, as does the next.

OBRINUS. Wings entire, above brown, with a blue band and ferruginous spot, beneath green, with a whitish band.

LUCINDUS. Wings entire, barred with black, above blue, beneath fulvous. It inhabits Surinam.

LIRIOPE. Wings entire, fulvous, the border brown, with fulvous spots; lower ones yellowish, with fulvous waves. It is a native of Guiana.

ARMINIUS. Wings entire, both surfaces alike; fulvous, with reddish lunules and dots.

MORPHEUS. Wings entire, fulvous, spotted with black; lower ones with a streak of black dots on each side.

LYSIDICE. Wings entire, blue, with a black border above, and bands beneath. Found at Surinam.

EUMENUS. Wings entire, brown, with a white band, which in the lower ones is terminated on each side by a fulvous spot. Native of Cayenne.

DARDUS. Wings entire, brown; upper pair with a blue eye in the middle of each side; all beneath with two ocellar streaks. This and the next are found at Surinam.

ARCAS. Wings entire, blue; upper pair spotted with

white; lower ones with a black and white marginal spot. It inhabits Surinam.

CANTHUS. Wings entire, above brown, immaculate; lower ones with six eyes beneath. Found in North America.

EURYTHIS. Wings entire, brown; upper pair with two eyes on each side; lower ones with a single pupil, one above and four beneath; all of them with a double pupil. It is found in the island of Jamaica.

HERMES. Wings entire, above brown; immaculate, with six eyes on the upper pair, three of which are blind. Found at Brazil.

IRIUS. Wings entire, with a yellow disk; lower ones with a single eye above and one beneath. A native of New Holland. Preserved in Sir Joseph Banks' museum.

MINEUS. Wings entire, brown; upper pair with a single eye above; lower ones with seven beneath and a white band. It inhabits China.

CRANTOR. Wings entire, brown; lower ones with a single bipupillate eye above, and five beneath, the first and fourth bipupillate. It inhabits India.

MERGUS. Wings entire, brown, both surfaces alike; upper pair with four eyes, the anterior one with a double pupil; lower ones with five. It is an African insect.

Hesperia. Rurales.

CUPIDO. Lower wings six-toothed; tailed; beneath whitish, with silvery spots. It inhabits America.

CNIDUS. Wings six-toothed, tailed, white, with a black border; lower ones with silvery spots beneath. A native of Surinam.

AGRIPPA. Wings three-tailed, blue with a black border, beneath cinereous, with a white streak and two rufous spots at the angle of the tail. It is a native of America.

HELIUS. Wings three-tailed; upper pair black, lower ones blue; beneath cinereous, with two brown streaks and two eyes at the angle of the tail. This is an inhabitant of Africa.

JANIAS. Wings three-tailed, blue, with a black border; beneath green. It inhabits Surinam.

PYTHAGORAS. Wings three-tailed, with a yellow border; beneath black, varied with white, and a white band in the middle. It inhabits India.

AMOR. Wings three-tailed, brown, the disk beneath variegated, and a golden streak behind on the lower ones. It inhabits India.

HESIODUS. Wings three-tailed, black with a blue disk, beneath white, with a common greenish streak, and two silvery dots at the angle of the tail. It is found in India.

TIMON. Wings three-tailed, greenish at the base; beneath white, with an abbreviated red band on the lower ones. It inhabits America; a specimen is in Dr. Hunter's museum.

MONOUS. Wings three-tailed, brown; beneath snowy, slightly barred with brown; the lower ones with two gilt eyes. This is a native of Africa, and preserved in Sir Joseph Banks' collection.

FAUNUS. Wings three-tailed, brown; beneath white, with two fulvous streaks. It inhabits Africa.

LISIAS. Wings three-tailed; upper pair brown, with a fulvous spot; lower ones beneath white, spotted with black. It inhabits Poulicandor, and is in Sir Joseph Banks' museum.

HYMEN. Wings three-tailed, brown, spotted with white beneath; upper pair white above. It inhabits Africa, and like the last is to be seen in Sir Joseph Banks' museum.

GABRIELIS. Wings nearly three-tailed, glossy blue; lower

PAPILIO.

lower ones beneath brown, with white bands before the tip. It is found in divers parts of America.

PINDARUS. Wings nearly three-tailed, blue, with a black border; beneath brown, with silvery and fulvous spots. Inhabits India.

CHITON. Wings three-tailed, blue with a brown border; beneath yellowish-white, with black bands.

PELION. Wings nearly three-tailed, blue, with gold dots and a brown border. It inhabits America.

AUNUS. Wings nearly three-tailed, blue, with a black border; beneath black, with white bands. It is an American insect.

PETUS. Wings nearly three-tailed, blue, with a black border; beneath brown; the base rufous dotted with white. It inhabits Surinam.

FREJA. Wings two-tailed, brown; the disk beneath brown, with a wavy streak, which on the upper pair is fulvous, on the lower ones black. It inhabits Tranquebar.

ETOLUS. Wings two-tailed, upper pair black; lower ones blueish, beneath whitish, with a black dot at the base, and two at the tip. Native of India.

VULCANUS. Wings two-tailed, above brown, with fulvous spots; beneath variegated with fulvous yellow and silvery streaks. It is a native of India.

GANYMEDES. Wings two-tailed, blueish, with a brown border; beneath greenish, at the base with gold dots. It inhabits India.

MARS. Wings two-tailed, brown; lower ones with a rufous spot and two white dots, and an oblique band beneath. A native of America.

CELERIO. Wings two-tailed, white; beneath with alternate brown and white bands, and a triple rufous eye at the angle of the tail. It inhabits Surinam, as do the two next.

EMATHEON. Wings two-tailed, glossy blue, beneath black speckled with blue.

DIDYMAON. Wings two-tailed, brown, the base beneath red with white ocellar dots.

EROSINE. Wings two-tailed, brown, upper pair with seven red dots, lower ones with three; upper pair with three silvery dots. It inhabits the Cape of Good Hope.

ISOCRATES. Wings two-tailed, brown, two approximate, wavy, darker streaks, and a double black spot at the angle of the tail. This, and the two following, are found in India.

ATYS. Wings two-tailed, brown, with a blue disk; beneath cinereous with brown veins, the base with a fulvous spot, and white dots.

SOPHOCLES. Wings two-tailed, black, with a common blue disk; beneath white, with wavy yellowish streaks, the lower ones with a fulvous dot at the tip.

EURIPIDES. Wings two-tailed, with a blue disk; beneath brown, with an abbreviated white streak on the upper pair, and two angular rufous streaks and marginal ocellar spots on the lower ones.

PHOLEUS. Wings two-tailed, blue; beneath black, with green and blue bands. A native of Surinam.

ANACREON. Wings two-tailed, brown, beneath wavy with white, and a macular fulvous streak behind. This and the next species are natives of India.

THALES. Wings two-tailed, black, with blue lunules beneath, lower ones beneath with an abbreviated sub-marginal gold band.

ENDYMION. Wings two-tailed; beneath green, with rufous and gold specks, lower ones with a black streak and red band.

VENUS. Wings two-tailed; lower surface of the upper

pair green, speckled with gold; of the lower ones gold, spotted with green and black. There is a variety of this species, of which the wings are three-tailed, blueish, tipped with black; beneath golden, speckled with black.

ECHEON. Wings two-tailed, above brown, beneath palish, with a rufous band, and terminal red eye. Found in America.

TELEMUS. Wings two-tailed, shining blue; lower ones with a marginal angular black streak beneath. Found in America.

DINDUS. Wings two-tailed, black, the thinner margin blue; beneath cinereous, with white spots, and a double rufous spot at the angle of the tail. It is found in India, as is the next.

CECROPS. Wings two-tailed, black, with a red band beneath.

HEMON. Wings two-tailed, above brown, immaculate; lower ones beneath with three blueish bands at the angle of the tail. A native of Surinam.

SPHINX. Wings two-tailed, blueish; beneath cinereous, with a double black spot at the angle of the tail. This and the next are natives of India.

MELIBÆUS. Wings two-tailed, blueish, with a brown border; beneath yellowish, with brown streaks on the upper pair, and black ones on the lower, angle of the tail black, with blue rings.

MÆCENAS. Wings two-tailed, black, with a blue disk beneath, with chestnut-brown clouds. It inhabits China.

TYRTÆUS. Wings two-tailed, brown; lower ones beneath with a wavy white streak, and black marginal lunules, the middle ones rufous. This and the next are natives of India.

XENOPHON. Wings two-tailed, brown, with a yellow disk; beneath cinereous, with a white streak in the middle, joined to a brown one.

MARSYAS. Wings two-tailed, above blue, beneath blueish with black dots. A native of America.

BATHIS. Wings two-tailed, blue, with a black eye; beneath brown, with white bands, angle of the tail rufous.

CYANUS. Wings two-tailed, shining blue; beneath with a white disk. Native of Surinam.

HYACINTHUS. Wings two-tailed, shining blue; under surface of the lower ones black in the middle, with a white band. It is found in India.

HALESUS. Wings two-tailed, blue, edged with black; lower ones each side spotted with gold at the tip. It is found in America.

ACHÆUS. Wings nearly two-tailed, brown fulvous spots, beneath yellow, with gold spots. It inhabits India, as does the next.

PERICLES. Wings two-tailed, black; beneath brown, wavy with white, angle of the tail with a double silvery spot.

FORMOSUS. Wings two-tailed, brown; beneath yellowish, with red and gold spots. It inhabits Surinam, as does the next.

METON. Wings two-tailed, white, with a brown border; upper pair with an ocellar gold spot.

THERO. Wings indented, nearly two-tailed, blackish, with fulvous spots, beneath with silvery spots. A native of Africa.

LIGER. Wings two-tailed, white, tipped with black, beneath brown, with white streaks, and lunules. An inhabitant of Surinam.

HARPAX. Wings tailed, fulvous, spotted with black, beneath cinereous, with gold dots. A native of America.

VALENS. Wings tailed, brown; beneath yellowish, with

PAPILIO.

with spots including gold ones. A native of Surinam, and so is the next.

PERION. Wings tailed, fulvous, with a brown border and bands, beneath dotted with gold.

AUGUSTUS. Wings tailed, white, with a brown border; beneath varied with ferruginous and yellow, the lower ones with two cinereous streaks. It inhabits America.

CENTAURUS. Wings tailed, blueish, with a brown border, beneath cinereous, with ocellar spots at the base. It inhabits New Holland, and is, with the next two, in the museum of Sir Joseph Banks.

GERONTES. Wings tailed, black, with a common transverse white spot; upper pair with an eye, lower ones with a double eye. Native of Africa.

JARBUS. Wings tailed, fulvous, with a brown border; beneath cinereous, with a white streak, lower ones with two black dots. It inhabits Siam.

CERANUS. Wings tailed, blueish; beneath chestnut-brown, at the base spotted with white. It inhabits India.

PANN. Wings tailed, brown; upper pair with a fulvous spot; lower ones with a black sub-marginal one; beneath cinereous, with two eyes at the angle of the tail. Found in Africa.

PHORBAS. Wings tailed, brown, with a white disk; beneath white, with cinereous streaks, and two black dots at the angle of the tail. It inhabits India.

* **BETULÆ.** Wings slightly tailed, brown; beneath yellowish, with two white streaks on the lower ones.

* **PRUNI.** Wings slightly tailed, above brown, with a red spot at the tip of the lower ones; lower wings beneath, with a fulvous marginal band dotted with black. This and the last species are found in this country.

SPINI. Wings tailed, brown; beneath cinereous, with fulvous marginal lunules, and a blueish spot near the tail. It is found in Germany, on the *Prunus spinosa*, hence its specific name.

FAVONIUS. Wings slightly tailed, brown, with fulvous spots; beneath cinereous, with two white streaks; lower ones with a sub-marginal fulvous band, and blueish at the angle of the tail. It is found in America.

* **QUERCUS.** Wings slightly tailed, blueish; beneath cinereous, with a white streak, and double fulvous dot near the tail. A native of England, and other parts of Europe.

LINCEUS. Wings tailed, brown, immaculate; lower ones beneath with a lunulate white and rufous streak. Inhabits Russia, resembles the *P. spini*.

CERASI. Wings tailed, brown, immaculate; beneath a white streak, and fulvous lunules marked with a black dot on the lower ones. Inhabits Austria.

ACACIÆ. Wings tailed, brown; beneath blueish, with a white streak, and fulvous lunules near the tail. This is a Russian insect.

SYMETHUS. Wings slightly tailed, brown, with a white spot on the disk, upper pair tipped with black. Found in America.

BETICA. Wings tailed, blueish; beneath cinereous, with white waves, angle of the tail with a double gilt spot. Found in Europe and India.

APIDANUS. Wings tailed, blue; lower ones beneath brown, varied with blue, angle of the tail with a double gilt spot. Inhabits Surinam.

ÆLIANUS. Wings tailed, white; beneath cinereous, with white streaks, angle of the tail with a black eye. Found in the East Indies, as are the two following.

STREPHON. Wings tailed, brown, with a blueish disk; beneath cinereous, with a white band, and a double rufous eye at the angle of the tail.

ERICUS. Wings tailed, blueish; beneath varied with white and brown, the lower ones with two dots at the angle of the tail.

THEOPHRASTUS. Wings tailed, brownish; beneath white, spotted with black; lower ones with five marginal gilt dots. It is found in Morocco.

COLUMELLA. Wings tailed, brownish; beneath cinereous, with a streak of black and white dots, and two fulvous spots on the lower ones. Found in the South American islands.

CLEON. Wings tailed, brown; beneath cinereous, with a red streak on the upper pair, and band on the lower ones, angle of the tail with a double rufous eye. A native of Brazil; a specimen is in the museum of Sir Joseph Banks.

PHOCIDES. Wings tailed, above brown; lower ones white, with two black dots. It is found in Africa.

ALCIDES. Wings tailed, black, with a blue gloss, beneath ferruginous, with a yellow streak. It inhabits Sierra Leona.

PHILIPPUS. Wings tailed, brown; beneath white, with two fulvous streaks, and two sub-ocellar black dots at the angle of the tail. It is a native of India.

ATYMNUS. Wings tailed, fulvous; upper pair tipped with black. Found at Siam.

ERYX. Wings tailed, black; beneath green, with a slightly indented and spotted margin on the lower ones. It inhabits China.

ÆOLUS. Wings tailed, blue, with a black spot on the upper pair; all beneath with a white band streaked with black. This and the two following inhabit India.

CORIOLANUS. Wings indented, tailed, dull cinereous, with a common ferruginous streak.

PLINIUS. Wings tailed, varied with white and brown; lower ones beneath with a double gilt spot at the angle of the tail.

ACMON. Wings tailed, blue; lower ones beneath black, with green-gold streaks at the tip. Found in Surinam.

DEMOCRITUS. Wings tailed, shining blue; beneath black, spotted with white. Inhabits India.

AMYNTAS. Wings tailed, blue, with a black margin; beneath cinereous, with black dots, and two ferruginous ones on the lower pair at the angle of the tail. It inhabits Austria.

TIMEUS. Wings tailed, varied with fulvous and brown; upper pair beneath with ocellar black dots. It inhabits Surinam, as does the next.

SIMETHIS. Wings tailed, brown; beneath green with a silvery stripe.

SEDI. Wings tailed, blue, the margin spotted with white; beneath white, with square black spots and a rufous band. Inhabits Germany.

PHIDIAS. Wings tailed, blueish, with a brown border; beneath cinereous, all with a black dot at the angle of the tail. This is an Indian insect.

HERODOTUS. Wings tailed, blue; beneath green, with a streak of black and white dots on the lower ones. This and the next are inhabitants of India.

STRABO. Wings tailed, blue; beneath cinereous, with white waves; lower ones with two marginal dots, and two at the angle of the tail.

* **RUBI.** Wings slightly tailed; above brown; beneath green. This is found in our own country, and other parts of Europe.

PLATO. Wings tailed, blue, with a brown border; beneath cinereous, with white waves; lower ones with a black bipupillate eye. This and the six following are natives of India.

ROSIMON.

PAPILIO.

ROSIMON. Wings tailed, white, with a black border, and dots on the disk; beneath dotted with black, angle of the tail with three gold dots.

HIPPOCRATES. Wings tailed, brown, tip with white; beneath white, dotted with black.

THEOCRITUS. Wings tailed, greenish, with a darker rib; beneath black, dotted with yellow.

LINCUS. Wings tailed, white, tip with brown; beneath with white and black bands, angle of the tail with three white dots.

PARRHASIUS. Wings tailed, blue; beneath cinereous, with white streaks; lower ones with marginal gold dots.

AMYNTOR. Wings indented, tailed, black, with a fulvous spot at the base, the tip with a yellow band.

NARCISSUS. Wings indented, brown, with a blueish disk; beneath with red spots and bands with silvery edges. Inhabits New Holland, as does the next.

APELLES. Wings indented, fulvous, with a border; lower ones beneath with rufous bands and silvery edges.

HERACLITUS. Wings indented, black, with a fulvous spot on the upper pair; lower wings with a blue spot above, and yellowish streaks and blue dots beneath. It is a native of America.

PLAUTUS. Wings indented, brown, above immaculate, beneath with transverse black and white lines. It inhabits India.

THYSBE. Wings denticulate, fulvous, spotted with black; lower ones beneath friate, black spotted with gold. Inhabits Africa.

NAIS. Wings indented, the base silvery, with gold streaks. A native of the Cape of Good Hope.

MELEAGER. Wings indented, blue, with a black border, beneath grey, with black ocellar dots. It inhabits Germany.

EPULUS. Wings entire, brown, with fulvous spots; beneath variegated. Inhabits Surinam.

* **ARIGN.** Wings above blue, edged with brown, and spotted with black, beneath grey, with numerous small eyes. This inhabits our own and other countries of Europe.

EREBUS. Wings entire, brown; all with a streak of ocellate dots beneath. It inhabits Germany.

ALCON. Wings entire, blue, edged with brown, beneath grey-brown, with numerous eyes. Inhabits Austria.

DAMON. Wings entire, blue, beneath grey-brown, with numerous dots and a white band on the lower ones.

CYLLARUS. Wings entire, blue edged with black; beneath grey-brown, with a streak of ocellate dots, the hind ones blue at the base. This is an European insect.

* **ARGIOLUS.** Wings entire, blue edged with black, beneath blueish-grey, spotted with black. This species is common to this and other European countries.

ACIS. Wings entire, blue, beneath grey-blue, with oblong, black simple dots. It inhabits Austria.

* **ALSUS.** Wings entire, brown, immaculate, beneath cinereous, with a streak of ocellate dots. Found in England.

CAJUS. Wings entire, brown, with a blueish disk, beneath varied, cinereous and white, with brown ocellar dots. It inhabits India.

OTIS. Wings entire, brown, with a blue base, beneath cinereous, with a dot in the middle, and streak on the upper pair, and numerous ocellar dots on the lower ones. Found in China.

* **ARGUS.** Wings entire, lower ones beneath with a ferruginous border, and silvery blue eyes. This and the

three following are found in England, and other European countries.

* **HYACINTHUS.** Wings entire, blue, lower wings beneath with a marginal row of red eyes, and a circle of black ones on the disk.

* **ARTAXERXES.** Wings entire, brown, upper pair with a white dot in the middle; lower ones with rufous marginal lunules, beneath with rufous and white dots on the margin.

* **TITUS.** Wings entire, brown, immaculate; lower ones ocellate beneath, and a macular fulvous streak behind.

OPILETE. Wings entire, blueish, with a blackish edge; lower ones beneath cinereous, with ocellar black dots, and two fulvous lunules. It inhabits Russia, as does the next.

TRITON. Wings entire, blueish, beneath a ferruginous streak, and numerous black dots.

* **CORYDON.** Wings entire, blue edged with black; beneath cinereous with black ocellar dots, lower ones with a central white spot. This and the next are found in England.

* **ADONIS.** Wings entire, blue, with a black marginal streak, beneath cinereous, with numerous ocellar dots, and a white central one on the lower ones.

DORYLAS. Wings entire, blue, beneath cinereous, with a dot in the middle of the upper pair, and streak of ocellar dots behind. It is found in Austria.

HYLUS. Wings entire, with a black lunule in the middle, and marginal dots; beneath cinereous, with ocellar dots. It inhabits Austria.

BATTUS. Wings entire, blackish-blue beneath, whitish with numerous black dots; lower ones with a continued fulvous band. Found in Germany.

ARGIADES. Wings entire, blue, with a brown edge, beneath grey-brown, with a lunule in the middle, and two streaks of ocellated dots. It inhabits Saxony.

AMPHION. Wings entire, blue edged with black; beneath cinereous, ocellate with black; lower ones with red lunules, marked before with a white lunule, behind with a black gold dot. It inhabits Germany.

ACREON. Wings entire, brown, beneath paler, with black ocellate dots; lower ones with a white and red band and streak of gold dots. It is found in Russia.

HEBRUS. Wings entire, brown, varied with blue; lower ones blue, with a white inner margin. It inhabits Surinam.

AVIUS. Wings entire, both surfaces alike, brown, with two blue streaks at the tip. It is a native of the West Indies.

ACANTHUS. Wings entire, brown, immaculate, beneath pale ferruginous, with blue bands and yellow border. It is found at Surinam, as is the next.

CENEUS. Wings entire, black, with blue waves; the margin dotted with white.

ERINUS. Wings entire, brown, beneath cinereous, with a double black dot on the hind angle of the lower ones. It inhabits New Holland; a specimen is in the museum of Sir Joseph Banks.

ICARUS. Wings entire, above with brown bands, beneath with alternate white and black bands. Found at Surinam.

PARCIMON. Wings entire, brown, beneath cinereous, with white waves; lower ones with ocellar black dots at the base and eye of the tip. It inhabits Africa.

DAMOETES. Wings entire, brown, beneath with cinereous waves, lower ones with a double gilt eye. Inhabits

New

PAPILIO.

New Holland. Specimens of this and the last are in Sir J. Banks' museum.

CERAUNUS. Wings entire, brown, with a blue gloss; beneath cinereous, lower ones with ocellar black dots at the base, and an eye and dot at the tip. This species and the next inhabit the South American islands.

CATILINA. Wings entire, brown, with a blue gloss; beneath with white bands and two blue eyes at the angle of the tail.

MINEREUS. Wings entire, brown, lower ones beneath with ocellar red dots, and an eye at the angle of the tail. It inhabits America.

HYLAX. Wings entire, above brown, immaculate, beneath cinereous, dotted with black. It inhabits the East Indies.

TELEPIUS. Wings entire, black; upper pair dotted with white; lower ones above rufous at the base, beneath blue, varied with black. It inhabits America.

EMYLUS. Wings entire, black dotted with white; upper pair with a yellow band; all beneath variegated. It inhabits Surinam.

CARICÆ. Wings entire, brown, with a common white disk, the border cinereous, subocellate. It inhabits America.

PELOPS. Wings entire, white, with a common brown border, on which are a few fulvous spots, and a streak behind. It inhabits Cayenne.

LAMIS. Wings entire, brown, with a common abbreviated white and fulvous band. It inhabits Cayenne, as does the next.

CACHRYS. Wings entire, blue, with a double white spot on the upper pair, beneath cinereous, with black lines.

LAGUS. Wings entire, blue, with a double white spot on the upper pair, beneath cinereous, with black lines. It inhabits Surinam.

MÆCENAS. Wings oblong, both surfaces alike, black, with a common red band and line on the upper pair. Found at Guadaloupe.

MANTUS. Wings oblong, entire, variegated blue and brown, with a common white band. It inhabits Africa.

MIDAS. Wings subangular, brown, with a whitish spot, beneath white at the base, with a rufous streak. It inhabits India, as do the three following.

BIBULUS. Wings entire, brown; beneath white, with a silvery band dotted with brown on the lower pair.

ÆSOPUS. Wings entire, above brown, with a white spot, beneath white, immaculate.

PHÆDRUS. Wings entire, fulvous, with a brown margin, beneath white, immaculate.

BIAS. Wings entire, black, with a blue gloss, beneath brown, with a white hind margin. Inhabits Cayenne.

PHAREUS. Wings entire, both surfaces nearly alike, red, with a black border. This and the next species inhabit Surinam.

TACITUS. Wings entire, fulvous, outer margin of the upper pair black, spotted with yellow.

CÆNUS. Wings entire, white, outer margin of the upper pair brown spotted with white. A native of India.

PROCAS. Wings entire, both surfaces alike, black, with yellow disk, on the upper pair a yellow spot. This and the following inhabit Surinam.

ALPHONSUS. Wings entire, black; upper pair with two yellow spots, lower ones with a single one at the base.

* **HIPPOTHOE.** Wings entire, orange edged with black and white; beneath cinereous, with numerous black ocellar dots. Found in England.

* **VIRGAURÆ.** Wings subangular, fulvous, edged with

black; beneath with black and white dots. Found in this and other European countries.

CIRYSEIS. Wings gold, with a bluish margin, lower ones slightly indented, beneath dull grey, with numerous ocellar dots. It inhabits Austria.

SALUSTIUS. Wings entire, fulvous, varied with black; upper pair beneath dotted with black, lower cinereous, with brown spots. This and the next inhabit India.

FLORUS. Wings entire, fulvous, edged with black, the base beneath dotted with black.

HIERE. Wings brown, dotted with black, beneath cinereous, with numerous ocellar dots. It inhabits Austria.

* **PHILÆAS.** Wings entire, fulvous, dotted with black, beneath blueish. It inhabits England.

ARCAS. Wings entire, fulvous, with black margin and dots, lower ones beneath grey, immaculate. Inhabits the Cape of Good Hope.

BALLUS. Wings entire, fulvous, with a brown margin; lower surface of the upper pair dotted with black, of the lower ones green, edged with brown. It inhabits Spain.

HELLE. Wings entire, dusky, with a blue gloss; all beneath with numerous ocellar dots. It is found in Germany.

XANTHE. Wings entire, brown, with black dots, and a marginal fulvous band, beneath yellowish, with numerous dots. It is found in Russia.

GARBUS. Wings brown, dotted with black, and edged with white, beneath greenish, with numerous dots. It inhabits Austria. Probably the other sex of the last.

THERSAMON. Wings slightly tailed, fulvous, with numerous ocellar dots beneath; upper pair beneath fulvous, lower ones cinereous. It inhabits Russia.

LUCIANUS. Wings entire, dotted with black, above fulvous, beneath cinereous. Inhabits Guadaloupe.

PENTHEUS. Wings entire, fulvous, spotted with black; tip of the lower ones white, dotted with black. It inhabits Surinam, as well as the next.

ULRICUS. Wings entire, glossy-blue, beneath pale chestnut-brown at the base, upper pair with a tripupillate eye.

THYRA. Wings indented, the disk fulvous, dotted with black, beneath purplish, with silvery spots. It is found in Guinea.

ZEUXO. Wings entire, the disk fulvous, dotted with black; upper pair with silvery dots. This and the two next are found in different parts of Africa.

JUBA. Wings entire, black, with a fulvous disk, beneath with a white band, and abbreviated streaks.

LARA. Wings entire, subtestaceous; upper pair with one eye above, and the lower ones with two.

CEPHUS. Wings entire, brown, beneath with blue bands and a single eye on the upper pair, and two on the lower ones. It inhabits India.

DOMITIANUS. Wings entire, brown, upper pair with a green spot; lower ones with a green band; beneath pale ferruginous, with silvery dots, and marginal streak. It inhabits Guadaloupe.

LIVIUS. Wings entire, black, with a blue spot on the disk; lower ones beneath cinereous, with rufous bands that are silvery at the edge. This and the next inhabit India.

ROMULUS. Wings entire, brown, beneath green, with a rufous spot on the lower ones.

ACTORIS. Wings entire, both surfaces alike, brown dotted with white. Inhabits Surinam.

CASSIUS. Wings entire, above white, with a brown border on the upper pair, and five white dots on the hind margin of the lower ones. This is a native of Surinam.

PAPILIO.

ISARCHIUS. Wings entire, blue, with a white band on the lower ones, beneath varied with white and black. This and the next are of America.

CARACTACUS. Wings entire, brown, with a white spot on the disk; beneath variegated, a brown band with a silvery edge on the lower ones.

OURANUS. Wings entire, both surfaces alike, black with a common white band, ending in a red spot behind. Found at Surinam.

HARALDUS. Wings entire, blue, with a black border, beneath white, the margin dotted with black. It inhabits the East Indies.

TALUS. Wings entire, with brown and blue bands, and an abbreviated red band beneath. Found at Surinam.

NELEUS. Wings entire, both surfaces alike, black; upper pair with ten white dots; lower ones with a white disk. Found in India.

ATHEMON. Wings entire, brownish, with a common white disk, and a brown half band behind. It inhabits America.

REGULUS. Wings entire, black, with two yellow bands, the posterior one on the upper wings interrupted. Found in America.

HISRON. Wings entire, black, with three yellowish bands, the hind one interrupted. Inhabits India.

TARQUINIUS. Wings entire, black; upper pair with an oblong yellow spot at the base, lower ones yellow, spotted with black at the angle of the tail. Found also in India.

GEMELLUS. Wings entire, yellowish, with a brown border, beneath white, with a red streak in the middle and marginal lunules. Inhabits Cayenne.

PTOLOMÆUS. Wings entire, ferruginous, with brown streaks; beneath blue, paler at the base. This, and the four that immediately follow, are natives of India.

ARCHIMEDES. Wings entire, black, with a blue disk, beneath brown, immaculate.

LUCIUS. Wings entire, both surfaces nearly alike, fulvous, with black waves.

OVIARIUS. Wings entire, dotted with gold; above fulvous, beneath yellowish.

SUETONIUS. Wings entire, yellow, with a brown border; under surface of the upper pair with silvery black dots; of the lower pair cinereous.

ELECTRON. Wings entire, both surfaces alike, black, with a yellow band and sanguineous dot at the tip. It inhabits Cayenne.

SAGARIS. Wings entire, black, with a common transverse fulvous spot. This and the next inhabit Surinam.

EURITEUS. Wings entire, black, with a blue spot; beneath rufous in the middle, with white bands.

PHERECLUS. Wings entire, both surfaces alike, black; upper pair with a linear red band. This and the next are natives of America.

LYSIPPUS. Wings angular, brown, all of them with a red streak, beneath with cinereous dots.

ÆMULIUS. Wings entire, cinereous, spotted with brown and white; the lower ones pale above; beneath all dotted brown. Inhabits India.

GEMINUS. Wings rounded, blue, with a black border, in which is a blue streak; lower ones beneath subfasciate, with brown. A native of America.

LUCANUS. Wings entire, black, with a yellow disk; lower ones beneath red, with square brown spots. Inhabits India.

PERDITUS. Wings entire, both surfaces alike, black,

with a fulvous band. It inhabits Cayenne, as does the next.

PYRAMIS. Wings entire, brown, with a blue gloss, and a fulvous band; lower ones beneath grey.

PRIASSUS. Wings entire, both surfaces alike, black; upper pair with a double fulvous band. This and the four following inhabit India.

THUCYDIDES. Wings entire, black, with a fulvous spot on the disk, beneath cinereous, with rufous waves.

VIRGILIUS. Wings entire, black, with a blue thinner margin, beneath grey, with three whitish lunules, including a black dot on the lower ones.

PETRONIUS. Wings entire, blue streaked with black, beneath brown, cinereous, dotted with black.

NUMITOR. Wings entire, brown, with a yellow disk on the lower ones, beneath yellow, immaculate.

PHILLIASUS. Wings entire, brown, spotted beneath; lower ones with two eyes above on the hind part, and one beneath. It inhabits Africa.

GYAS. Wings entire, brown, beneath fulvous, with punctured gold streaks. A native of Surinam.

ÆGON. Wings entire, brown, with numerous macular fulvous bands. Inhabits Jamaica.

Hesperia. Urbicole.

EXCLAMATIONIS. Wings entire, divaricate, brown; upper pair with a yellowish line and dots under it. Inhabits India.

* **COMMA.** Wings entire, divaricate, fulvous, with a black line on the upper pair; beneath spotted with white. This is found in England.

PROPERTIUS. Wings divaricate, black, spotted with yellow; lower ones beneath with alternate, rufous, and yellow bands. This and the next are natives of India.

TIBULLUS. Wings entire; upper pair black, spotted with yellow; lower ones yellow, with a black border.

LINEA. Wings entire, divaricate, fulvous, edged with black. It inhabits Aultria.

* **SYLVANUS.** Wings divaricate, dark orange, with square yellow spots above, and whitish ones beneath. This is an English butterfly, as well as the next.

* **THAUMAS.** Wings divaricate, orange, with a darker patch at the base, the upper pair, in the male, with a black line in the middle.

OTHO. Wings divaricate, brown, with fulvous spots at the base, and nearly square yellow ones each side on the disk.

AUGIAS. Wings divaricate, fulvous, with an oblique black band and hind margin. This is a native of India.

VITELLIUS. Wings divaricate, fulvous; upper pair with a brown margin and spot in the middle; lower ones with a brown border. Inhabits the South American islands.

COLON. Wings divaricate, fulvous, with a brown striate margin and spot in the middle. It inhabits India.

* **PANISCUS.** Wings divaricate, dark brown, with fulvous spots. Inhabits England, and has been described and figured by Mr. Donovan.

HELIRIUS. Wings entire, divaricate, brown, edged with black; upper pair with a central yellow dot. It inhabits Surinam.

SATURNUS. Wings divaricate, brown; upper pair dotted with white; lower ones striate beneath with white. Inhabits Cayenne.

ORIGENES. Wings divaricate, both surfaces alike, brown, with a streak of white dots; upper pair testaceous at the base. It is a native of India.

PAPILIO.

NOSTRODAMUS. Wings divaricate, brown; upper pair with a macular whitish band above; lower ones cinereous beneath. Inhabits Barbary.

PIITNEUS. Wings subangular, divaricate, brown, with an interrupted yellow band on the upper pair. This and the next are natives of Surinam.

HELIUS. Wings subdivaricate, brown; lower ones fulvous at the inner margin.

METIS. Wings entire, brown, with scattered fulvous spots; lower ones beneath, immaculate. Inhabits the Cape of Good Hope.

DIOSCORIDES. Wings entire, brown, spotted with yellow; lower ones beneath yellow with brown waves. It inhabits Tranquebar.

PLUTARGUS. Wings entire, brown, speckled with gold; upper pair with a testaceous spot at the tip above, and testaceous outer margin. This and the next are natives of India.

EPICTETUS. Wings entire, black, with a yellow disk; upper pair with a brown spot, including a yellow lunule; lower ones beneath yellow, immaculate.

SILENUS. Wings tailed, brown, beneath pale chestnut, with a yellowish streak. It inhabits Africa.

ORION. Wings tailed, brown; upper pair with semi-transparent spots; lower ones with white tails. This and the next are inhabitants of Surinam.

EUDOXUS. Wings tailed, brown; upper pair with a white band on each side; lower ones on the under surface only.

PROTEUS. Wings tailed, brown, with transparent spots; antennæ hooked. A native of America.

CHEMNIS. Wings slightly tailed, brown, with hyaline spots and yellow hind margin. It inhabits India.

TITYRUS. Wings slightly tailed, brown; upper pair with a yellow band on each side; lower ones with a silvery streak beneath. A native of America.

MURETUS. Wings slightly tailed, brown, with hyaline spots. This and the next are natives of India.

MEATUS. Wings slightly tailed, black; upper pair with hyaline spots; lower ones beneath brown, with a white band at the base.

EPITUS. Wings slightly tailed, brown, spotted with yellow; lower ones beneath with a silvery band. A native of Surinam.

LYCIDAS. Wings slightly tailed, brown, with black teeth; upper pair with a yellow band on each side; lower ones beneath clouded with brown at the base, and afterwards white. It inhabits America.

NICIAS. Wings slightly tailed, fulvous; upper pair brown at the tip, with a yellow hyaline spot. It is found at Cayenne, as is the next.

MERCURIUS. Wings slightly tailed, brown, yellow at the base, with hyaline dots on the upper pair; lower ones beneath black, with a cinereous band.

THYRSIS. Wings slightly tailed, brown, with a yellow band on the upper pair, beneath all of them purple, speckled with yellow. It is found in America.

ALPHÆUS. Wings slightly tailed, black, with a red band; beneath variegated. A native of the Cape of Good Hope.

PRETUS. Wings slightly tailed, black, spotted with green, beneath ferruginous, spotted with yellow. This also is a native of the Cape.

PHOCAS. Wings slightly tailed, brown, with diaphanous spots; lower ones beneath with a black dot at the base. A native of America.

MOMUS. Wings slightly tailed, brown, with hyaline streaks at the base, and spots at the tip. It inhabits Cayenne.

VESPASIVS. Wings slightly tailed, rusty-brown; upper pair with yellowish dots at the tip. Found in India.

RHETUS. Wings slightly tailed, fulvous; outer margin of the lower ones blue-black. This and the three next inhabit Surinam.

CLONIAS. Wings slightly tailed, black; upper pair with a snowy band; lower ones beneath blueish, tail fanguineous.

ACASTUS. Wings slightly tailed, black; upper pair with a snowy band; lower ones beneath greenish, with abbreviated yellow streaks.

PALÆMON. Wings slightly tailed, blueish; upper pair with a rufous dot in the middle; lower ones rufous at the angle of the tail.

JULIANUS. Wings slightly tailed, brown; upper pair spotted with yellow; lower ones beneath varied with brown and glaucous. It inhabits Jamaica.

BRONTES. Wings slightly tailed, both surfaces alike, brown; upper pair with a snowy band; lower ones with a snowy margin. It inhabits America.

ARINUS. Wings tailed, both surfaces alike, black; upper pair with a transverse snowy spot; tail ferruginous.

ALEXIS. Wings tailed, brown; lower ones with a blueish band beneath. This and the next are natives of India.

MITHRIDATES. Wings rounded, black, with a purple spot and band behind, including paler lunules.

JUPITER. Wings without tails, black with a green gloss, beneath green, with black veins and margin; head and tail fanguineous. It inhabits Africa.

CASSANDER. Wings without tails, both surfaces alike brown, immaculate.

POLYBIUS. Wings without tails, black; upper pair with a fulvous spot; lower ones yellow at the angle of the tail. This and the three following are natives of India.

THRAX. Wings without tails, brown, with a few diaphanous spots; antennæ hooked.

ENNIUS. Wings brown; upper pair with hyaline spots; lower ones above black, with a yellow disk, beneath brown, with a white disk.

SCYPIO. Wings without tails; upper pair with a hyaline white band on each side, above black, beneath green.

MARCUS. Wings without tails, brown, with hyaline spots; lower ones beneath with two yellowish fillets; the thinner margin fulvous. It inhabits Cayenne.

FLESUS. Wings without tails, brown; upper pair with diaphanous spots; disk of the lower ones white, dotted with black. A native of Africa.

CICERO. Wings rounded, brown; upper pair with white hyaline spots; lower ones with a white hyaline disk. It inhabits the East Indies.

ATTICUS. Wings rounded; upper pair brown, with black spots and hyaline dots; lower ones hyaline, with black spots. It is found in India.

CLERICUS. Wings rounded, brown, subfasciate, with black; upper pair with hyaline dots. This and the next four inhabit different parts of the continent of America.

LUCAS. Wings without tails, brown; upper pair with yellow hyaline spots on both surfaces.

JUVENALIS. Wings without tails, brown; upper pair spotted with black, and dotted with white.

BATHYLLUS. Wings without tails, brown; upper pair with

PAPILIO.

with diaphanous square white spots; lower ones beneath with clouded waves.

AECIUS. Wings without tails, brown; upper pair with white diaphanous spots; all of them beneath palish purple at the tip.

NEPOS. Wings rounded, black; upper pair dotted with white; lower ones white at the angle of the tail above and beneath, with a white disk. It inhabits India, as do the next five species.

NERVA. Wings entire; upper pair brown, spotted with white; lower ones above black immaculate.

CÆSAR. Wings entire; upper pair brown, with diaphanous spots; lower ones black, with a snowy spot in the middle.

TERTULIANUS. Wings entire, rounded, blueish, spotted with black; the upper pair with white dots.

ORCUS. Wings rounded, brown; upper pair spotted with yellow; lower ones beneath blueish.

DAN. Wings without tails, dull cinereous, dotted with brown; upper pair with hyaline spots.

NOTHUS. Wings without tails, brown; upper pair with hyaline dots; lower ones beneath white; the margin brown, with six ocellar dots. Inhabits America.

SILVIUS. Wings without tails, brown; the disk yellowish, spotted with brown; lower ones beneath cinereous, with brown waves. Inhabits the Cape of Good Hope.

SALUS. Wings indented, fulvous, with black bands; upper pair with hyaline spots; lower ones hyaline in the centre. Inhabits Surinam.

JACCHUS. Wings without tails, spotted with yellow; lower ones with six snowy dots. Inhabits New Holland.

GNETUS. Wings indented, both surfaces nearly alike, black; upper pair with three hyaline spots; lower ones with blue bands. This and the next are natives of India.

ALSARIUS. Wings indented, black; upper pair with yellow and white spots; disk of the lower ones yellow, with black dots.

ANAPHUS. Wings entire, both surfaces alike, brown; lower ones yellow at the tip. Inhabits Surinam.

SEBALDUS. Wings without tails, varied with brown and black; lower ones beneath yellow at the angle of the tail. It is found in America.

EVADRUS. Wings without tails, brown, with a yellow disk; upper pair with subocellar silvery dots beneath. Inhabits the Cape of Good Hope.

BIXÆ. Wings rounded, brown, greenish at the base; lower ones beneath with a yellow band. Inhabits America.

POLYCLETUS. Wings slightly tailed, green-brown, with a white spot on the upper pair; beneath with fulvous silvery spots on the margin. Native of India.

ARACINTHUS. Wings rounded, entire, brown; lower ones beneath grey, with ocellar spots. It inhabits Austria.

BUSIRIS. Wings oblong, entire, black; upper pair with two yellow spots and dots; lower ones with a yellow disk. This is a native of India.

PISISIRATUS. Wings entire, brown; lower ones with a yellow disk above, and a snowy band, dotted with black beneath. It is a native of America.

HEMES. Wings rounded, entire, black; upper pair with a white spot; lower ones with a white band. This and the next are natives of Surinam.

EUMELUS. Wings rounded, entire, black; upper pair spotted with white; lower ones fulvous, with black veins.

PHILEMON. Wings rounded, entire, black, immaculate. Native of America.

THRASIBULUS. Wings entire, black, with blue lunules;

lower ones beneath at the angle of the tail cinereous, dotted with brown. This and the two following are natives of India.

CELSUS. Wings entire, both surfaces alike, black; upper pair with a yellow band.

ZELEUCUS. Wings entire, both surfaces alike, black; lower ones edged with white; head and tail sanguineous.

MÆNAS. Wings entire, glossy green, black, edged with white; lower ones beneath with a white band; mouth and tail red. A native of America.

PHIDIAS. Wings entire, glossy black, edged with white; mouth and tail red. Inhabits Asia.

AMIATUS. Wings entire, black, with a yellow hind-margin; head and tail red. A native of America, and so is the next.

ÆSCULAPIUS. Wings entire, black, with fulvous spots, the margin dotted with yellow.

LYCAGUS. Wings rounded, entire, blue-green, immaculate; tail red. Inhabits Surinam.

CATULLUS. Wings rounded, entire, black; upper pair dotted with white; lower ones with a streak of white dots. This and the two following species are natives of India.

JOVIANUS. Both surfaces of the wings alike, black; lower ones radiate with blue and white.

SALVIANUS. Wings entire, brown, spotted with green; lower ones beneath white, with a marginal streak of brown dots.

OILEAS. Wings rounded, entire, varied with black and white; lower ones beneath cinereous, with wavy black streaks. It is found in America.

MAIMON. Wings entire, white, with black margin and spots. Inhabits Cayenne.

TALAUUS. Wings entire, both surfaces alike, brown; upper pair with white dots and red base; lower ones with a white disk. Found in India.

MIMAS. Wings entire, brown, with a ferruginous margin; beneath with a streak of black dots. This and the next inhabit Surinam.

GENTIUS. Wings entire, both surfaces alike, yellow, with a black border; upper pair with yellow bands.

PELOPIDAS. Wings entire; upper pair dull cinereous, with a brown line in the middle; lower ones cinereous. This and the next species are natives of India.

GALENUS. Wings entire, both surfaces alike, brown, spotted with yellow.

* **MELVÆ.** Wings indented, divaricate, brown, with cinereous waves; upper pair with hyaline dots; lower ones with white dots beneath. Inhabits this country.

ALCÆE. Wings divaricate, varied with brown and cinereous; upper pair with hyaline dots; lower ones beneath cinereous, immaculate. Inhabits Russia.

SIDÆ. Wings entire, divaricate, black, with square white spots; lower ones beneath cinereous, with two yellow bands. Inhabits Russia.

* **FRITILLUM.** Wings entire, divaricate, black, dotted with white. It inhabits Europe.

GALBA. Wings entire, divaricate, black, dotted with white; lower ones beneath grey, with two white bands. It inhabits Tranquebar.

MÆVIUS. Wings entire, above black, beneath greenish, with white lines and spots on both surfaces. Inhabits the East Indies.

LAVATERÆ. Wings entire, brown; upper pair with white spots; lower ones with white dots; all with a snowy lunule in the middle. It inhabits Germany.

MENALCAS.

MENALCAS. Wings entire, both surfaces alike, white edged with black. It inhabits India.

MENIPPUS. Wings entire, striate, brown, with a broad white band, in the middle of which is a brown dot. It inhabits Surinam.

CLITO. Wings entire, both surfaces alike, black; upper pair dotted with white; lower ones with a white band. It inhabits Cayenne.

VIBRIUS. Wings entire, black; upper pair with three white dots; lower ones tipped with white. Inhabits Surinam, as do the two next.

CURTIVS. Wings entire, both surfaces alike, black; upper pair with four white dots; lower ones immaculate.

PHOREUS. Wings entire; upper pair brown; lower ones yellow.

* **TAGES.** Wings entire, denticulate, brown, with obsolete white dots. A native of England and other parts of Europe.

NISO. Wings entire, sub-reversed, brown; upper pair with four white scattered dots above. This and the two remaining species are natives of India.

SHIO. Wings entire, reversed, blackish, every where spotted with white.

PYGMÆUS. Wings entire, brown, immaculate.

PAPILIO-Musca, a name given by some authors to a series of small insects, which seem to be of a middle nature between the fly and the butterfly classes. Its wings are in part covered with those scales in form of dust, which render the wings of the butterfly kinds opaque, and in part are transparent and glassy. Reaumur has called the wings *alies vitrées*, *glassy wings*. Reaumur's Hist. of Insects.

PAPILION-BOURDON, a name given by the French authors to a sort of butterflies, which while they feed keep upon the wing with a humming noise like that of the humble-bee. Reaumur. See **EPERVIERS** and **PAPILIO**.

PAPILION-a-quene, tailed butterflies, a name given by the French naturalists to a sort of butterfly, of which there are several species. The sides of the wings of these butterflies are jagged, and one of the jags run out so far beyond the rest as to represent a sort of tail issuing from the creature. Reaumur.

PAPILIONACEÆ, in *Botany*, the 32d among the natural orders of Linnæus, composing a principal part of the **LEGUMINOSÆ** of Jussieu; see that article, and **PAPILIONACEOUS Flowers**; see also **DIADELPHIA**. In addition to what is to be found under the last-named article, respecting the qualities and uses of these plants, it may be mentioned that Linnæus, in his *Prædicationes*, has observed that scarcely any of them are medicinal, except *Glycyrrhiza*, the Liquorice, for *Galega*, though recommended against the plague, is scarcely to be trusted, which we can readily believe. He asserts moreover that they have scarcely any scent. If this be intended of the flowers, the *Spartium junceum* and *Lathyrus odoratus* are powerful exceptions, indicated by his editor; to which Mr. Salisbury has added *Coronilla valentina*, *Lupinus luteus*, *Vicia Faba*, and various species of *Trifolium*. The herbage of some *Papilionaceæ* acquire a very penetrating durable scent, of a peculiar kind, in drying; as the common and blue Melilot, *Trifolium officinale* and *ceruleum*; with most of the genus *Trigonella*. The seeds of this family are of a flatulent quality, and best suited for the food of hard-working people.

Some of this order are very remarkable for their occasionally subterraneous mode of fructifying. *Lathyrus amphicarpos*, as well as *Vicia amphicarpa* of Dortnes, see Willd. Sp. Pl. v. 3. 1105, bear some flowers from their roots, considerably below the surface of the ground, which are pale

and deformed, but having perfect anthers and stigmas, produce good seed. The same individual plants have abundance of flowers and seeds upon their stems above, like those of their natural order. Others, after flowering, bury their flower-stalks and ripening germens in the ground, in a very curious manner. Such are *Glycine subterranea*, *Arachis hypogæa*, and our English *Trifolium subterraneum*, which last fixes itself by supplementary radicles from the tops of the buried stalks.

PAPILIONACEOUS FLOWERS, *Flores papilionacæ*, are so termed from a fancied resemblance in their form to a *Papilio*, or Butterfly, see the last article. This denomination appears, as Tournefort suggests, to have originated with the ingenious and learned Valerius Cordus, who in his *Historia Sturpium*, chap. 162, applies it to the flowers of the Bean. The word does not occur in the *Lexicon* of David Kyber, published in 1553, by the care of their common friend the great Conrad Gesner, eight years before the latter printed the works of Cordus.

Linnæus has very particularly described such flowers in his *Genera Plantarum* 358, at the head of his class *Diadelphia*, which is composed of them.

“**CALYX.** Perianth inferior, of one leaf, bell-shaped, withering; its base gibbous, attached by its lower side to the flower-stalk, obtuse and containing honey at the upper; its mouth with five acute, erect, oblique, unequal teeth, of which the lowermost is longest, and has no fellow; the upper pair shortest and furthest asunder: the bottom is internally moist with honey, including the receptacle.

COROLLA, called *papilionaceous*, is unequal; each *petal* being distinguished by an appropriate name, as follows.

The *standard* is one petal, larger than the rest, which it lies over and covers, in a flattish horizontal position. Its claw is inserted into the upper margin of the receptacle; and what projects beyond the calyx approaches to a roundish, almost entire, figure, having an elevated longitudinal line, especially towards the extremity, as if the petal were depressed at the sides. That part of the petal nearest the base, approaches to a semicylindrical shape, embracing the parts beneath. The border of the petal is depressed at each side, but a portion near the margin is reflexed upwards where the halved tube, or claw, ends; where the halved limb, or border, begins to expand, are two posterior concave impressions, prominent beneath, which compress the wings lying under them.

Wings two equal petals, one at each side of the flower, under the standard, incumbent at the margin, parallel, roundish-oblong, broadest outwards, straightest at their upper edge, more dilated into a roundish form at the lower. The base of each is divided, the lower portion thereof elongated into a claw, inserted at the side of the receptacle, and about the length of the calyx; the upper portion being shorter and inflexed.

Keel, the lowest petal, is usually deeply divided, situated under the standard, within the wings, boat-shaped, concave, compressed at the sides, in the position of a boat upon the water, mutilated at its base, whose lower part is extended into a claw, as long as the calyx, inserted into the receptacle, its lateral and upper segments being shorter, and twisted together with the corresponding parts of the wings. The sides of the keel agree with the wings in form, and nearly in situation, except in being interior to them, and somewhat lower. The outline of this petal, constituting the actual keel, extends half way in a straight line, then it gradually ascends, in a segment of a circle; but the margin, or upper edge, is straight to the end, where it unites in a blunt angle with the other.

STAMENS for the most part united, in two sets; their *filaments* of different shapes; one inferior, embracing the pistil; the other superior, lying upon that part.

The inferior *filament*, sheathing the germen, is in its lower half membranous, cylindrical, with a longitudinal slit above; the upper portion consists of nine awl-shaped divisions, having the same length and curvature as the keel of the corolla which incloses them, the intermediate or lower ones longer than the others in alternate pairs.

The superior *filament* is of a slender awl-shaped figure, lying over, and covering, the suture in the former, to which it answers in situation, being simple, and rather less permanent, so that, separating at its base from the former, it allows of the escape of the honey at each side.

Anthers small, equal, terminal, ten in all; one upon the upper *filament*; nine on the respective divisions of the lower.

PISTIL one, superior.

Germen oblong, somewhat cylindrical, slightly compressed, straight, the length of the cylinder, formed by the inferior *filament*, by which it is embraced.

Style awl-shaped, slender, ascending, the length and position of the segments of the lower *filament*, among which it is stationed, withering.

Stigma downy, at the upper part, immediately beneath the anthers.

PERICARP an oblong, compressed, obtuse *legume*, of two valves, having a longitudinal suture above as well as below, both straight, except that the upper slopes downwards towards the base, and the lower upwards near the extremity; it bursts finally along the upper suture.

SEEDS several, roundish, smooth, fleshy, pendulous, marked with the slightly prominent embryo, near the insertion of the scar. In germination the cotyledons retain the form of the two halves of the seed, (but do not always rise above ground.)

RECEPTACLES of the seeds minute, very short, taper at the base, attached to the seeds by an obtuse oblong disk, all inserted along the upper suture only, but in an alternate order, so that when the valves are separated they adhere alternately to each valve."

Such is the character of the diadelphous papilionaceous flowers, composing the third order of the 17th class in the Linnæan system; see DIADELPHIA. There are however many papilionaceous genera which have flowers with ten separate and distinct stamens, and which therefore range in the class DECANDRIA; see that article. Of the plants so circumstanced Linnæus knew but few, chiefly his *Sophora*, *Anagyris* and *Cercis*; but recent discoveries, especially in New Holland, have greatly added to the list; see DAVIESIA, DILLWYNIA, GOMPHOLOBIUM, MIRELIA, PULTENÆA. Neither are the *stamens* of the diadelphous tribe uniformly constructed in the precise manner above described. Some few, like *Smithia*, have them in two equal sets, five anthers to each; in others five of the anthers are occasionally imperfect. The *corolla* itself is liable to exceptions. In *Amorpha* it consists of a standard only, the wings and keel being deficient; in some species of *Erythrina* the wings are scarcely discernible, however conspicuous the other petals. In *Trifolium* the *corolla* is often really monopetalous, the standard, wings, and keel, though retaining much of the form and aspect proper to papilionaceous flowers, being all firmly united below into a tube. So in many genera of the *Diadelphia Decandria*, the two sets of *stamens* are really united into one, by a tubular base; thus becoming properly monadelphous. Yet the rest of their structure is such, as to evince their inseparable affinity with the others, like which they are to all appearance perfectly diadelphous.

Linnæus thought too much stress had been laid upon the figure of the *legume*, in characterizing the genera of this tribe, and he recommends the *calyx* as leading to very solid distinctions. He has also recourse to the *stigma*, which is certainly, in many cases, a very important part. He recommends, in his Gen. Pl. 360, according to the usual principles which justly guided him, that the foliage should not be referred to for generic characters; yet in his *Systema Vegetabilium* he very commodiously indicates certain distinctions in the habit of the class *Diadelphia*, by which the genera differ from each other; some having twining stems, as *Phaseolus*, *Dolichos*, *Crotalaria* and *Glycine*; some abruptly pinnate leaves, as *Orobanchus*, *Pisum*, *Lathyrus*, *Vicia*, *Ervum*, *Arachis* and *Abrus*; while in others the leaves are pinnate with an odd leaflet, as *Biserrula*, *Astragalus*, *Phaca*, *Hedysarum*, *Glycyrrhiza*, *Indigofera*, *Galega*, *Colutea*, *Amorpha*, &c. and in a third tribe the leaves are ternate, as *Trifolium*, *Lotus*, *Medicago*, *Erythrina*, *Genista*, *Cytisus*, *Ononis*, *Trigonella*, and most of the climbing genera. Yet some species of *Hedysarum* have simple, others pinnate leaves, and several *Genista* have simple ones.

PAPILLÆ, in *Anatomy*, small prominences on various organs of the body, particularly the skin and tongue. (See INTEGUMENTS and TONGUE.) The word papilla is also applied technically to the nipple of the breast.

PAPILLARIS, in *Botany*, a name used by some authors for the common *lampyris*, or nipple-wort.

PAPILLARY, PAPILLARIS, in *Anatomy*. See PAPPILLÆ.

PAPILLARY *Processes*, is a name which the ancients gave to the olfactory nerves, from the place of their origin, to the os cribriform. See NERVOUS *System*.

PAPILLON, PHILIBERT, in *Biography*, an industrious man of letters, the son of an eminent advocate at Dijon, where he was born in 1666. He was brought up to the profession of the law, but he afterwards embraced the ecclesiastical state, and received priests' orders in 1694. Previously to this he had obtained a canonry of no great revenue, but sufficient for his wants, since his great ambition was to be possessed of a good library, in order that he might devote himself to the cultivation of literature. His researches went chiefly to literary history, especially that of his own province, and the works of several other writers were enriched by his collections. He supplied P. Le Long with memoirs inserted in his "Bibliothèque des Historiens de France," and also with materials for his "Bibliothèque Sacrée." To M. P. Desmolets he communicated a number of critical and biographical articles for the use of his "Mémoires d'Histoire et de Littérature;" and in Niceron's memoirs, the lives of Peter Abelard and James Amyot are by his hand. The principal work of the abbé Papillon was his "Bibliothèque des Auteurs de Bourgogne," which appeared after his death in two volumes folio. He died at Dijon in the year 1738. He was endeared to all his acquaintance by his modest, frank, and amiable disposition. Moreri.

PAPILLOSUM FOLIUM, in *Botany*, is a leaf covered with soft succulent tubercles or granulations, of which the Ice Plant, *Mesembryanthemum cressifolium*, is a striking example; see LEAF. *Papulifolium* is nearly equivalent, and is sometimes used by Linnæus for the same thing, though he errs in ever making it synonymous with *verrucosum*. The latter character consists in hard cartilaginous warts, equally perceptible in the dried specimen and in the living one; the former, depending on succulency, changes its appearance greatly by drying, yet is clearly discernible to an experienced eye, even in that state, in the foliage of many species of
Mesem-

Mesembryanthemum, on which it then forms minute orbicular depressions.

PAPIMOUAGON, in *Geography*, a lake of Canada, 70 miles N.N.E. of Quebec. N. lat. 50°. W. long. 69 20'.

PAPIN, DENYS, in *Biography*, an ingenious physician, the son of Nicholas Papin, also a physician, was born at Blois. He took the degree of doctor, and travelled to England, where he was elected a fellow of the Royal Society, in December 1680. He passed the following year in London, and published an account of a machine which he had invented, and which still bears his name; this was "The New Digester, or Engine for the softening of Bones," 4to. 1681. It soon appeared in French, with the title of "La Manière d'Amollir les Os, et de faire cuire toutes sortes de Viandes en peu de tems et à peu de fraix." Paris 1682. The machine consists of a very strong metal boiler, with an air-tight cover screwed down with great force; hence the contained matter, being incapable of escaping either by evaporation or by bursting the machine, may be heated to a degree far beyond that of boiling water, so as to dissolve the gluten of bones and cartilages. He afterwards improved this digester, and it has since been much employed in chemical and philosophical experiments. He assisted Boyle in various experiments, of which an account is given in the history of the Royal Society. Papin was a Calvinist, and was therefore prevented from returning home by the revocation of the edict of Nantes. He afterwards resided at Marburg, where he taught the mathematics, and published a "Fasciculus Dissertationum de quibusdam Machinis Physicis," 12mo. 1696, and in 1707, he published at Francfort an account of a machine which he had invented for raising water by the action of fire, entitled "Ars nova ad aquam ignis adminiculo efficacissimè elevandam."

His father, Nicholas Papin, was author of several works, which, however, are nearly forgotten. Two of them related to the powder of Sympathy, which he defended; and one to the discovery of Harvey, which he opposed. Eloy Dict. Hist. de la Med. Gen. Biog.

PAPINACHOIS, in *Geography*, a river of Canada, which runs into the Saguenay; N. lat. 48 24'. W. long. 70° 50'.—Also, Indians of Canada, so named from the river. N. lat. 50° to 51°. W. long. 69° to 71°.

PAPINIANUS, in *Biography*, a celebrated Roman lawyer, who attained to the rank of pretorian prefect under the emperor Severus, in the year 194. His profound knowledge of the law, and his incorruptible integrity, gave him great influence during this reign, the rigours of which he softened by his counsels as much as lay in his power. On his death-bed, Severus recommended his sons Caracalla and Geta to the care and protection of this faithful servant; and he accordingly used all his efforts to preserve that fraternal union between them, which soon appeared in danger of dissolution. Caracalla deprived the prefect of his post, but did not banish him from his person, and when he had perpetrated the execrable murder of his brother, he earnestly solicited him to compose a paper in justification of it, to which he replied, that it was easier to commit a murder than to defend, and that it was a second murder to vilify the memory of the innocent. A man so honest was not likely to exist long, he was probably sacrificed to the emperor's repentment, in 212. Papinianus composed a great number of works, and formed several illustrious disciples. His authority as a lawyer rose beyond that of any of his predecessors; the emperor Valentinian III. made a decree, that in cases in which the opinions of judges should be divided, the preponderance should be given to that which should have the sup-

PAPIO, PAPIONES, in *Zoology*, the name of those species of monkeys which we call *baboons*; which see.

These are all species of the *simia* in the Linnæan system. See SIMIA.

PAPIRA, or POPYRA, in *Ancient Geography*, a town of Asia, in Galatia, upon the route from Palsinuum to Ancyra, between Vindia and Ancyra; according to the Itinerary of Antonine.

PAPIRE-MASSON, JOHN, in *Biography*, an historian, was born, in 1544, at Saint-Germain-Laval, in Forez. He was brought up among the Jesuits, and for some time taught in their seminaries in Italy and France. He afterwards quitted the society, studied the law at Angers, and was admitted an advocate in the parliament of Paris; it was on this occasion he changed his family name of Masson into Papire-Masson. His works are "Annalium, l.b. iv." relating to the history of France: "Notitia Episcoporum Galliarum:" "Vita Joannis Calvini:" "Elogia Virorum Illustrium:" "De Episcopis Urbis Romæ:" "Descriptio Fluminum Galliarum:" "Agobardi, Episcopi Lugdunensis, Opera." All his works are said to display considerable learning and research, but they are not so well esteemed with regard to accuracy. He distinguished himself by his learning and integrity, and obtained the post of substitute to the procureur-general. He died in 1611, much regretted by men of letters, of whom the principal were his particular friends. His life was composed by De Thou. Moreri.

PAPIRIA, in *Botany*, a name originally given by Thunberg, in the Lund Transactions, to the genus which he and all other botanists have subsequently called *GETHYLIS*; see that article.

PAPIRIAN CODE, a collection of imperial constitutions, &c. made by a private lawyer, whose name was Papius. See CODE.

PAPIRIUS CURSOR, the elder, in *Biography*, an eminent Roman commander, was master of the horse to Papius Crassus, when dictator, in the year 339 B. C. He was consul for the first time in the year 333 B. C., and was nominated dictator in the war with the Samnites B. C. 324. Having appointed Quintus Fabius Rullianus to be his master of the horse, he marched against the enemy, strictly enjoining Fabius not to engage during his absence. A favourable opportunity, however, occurred, and his master of the horse disobeyed the injunction, and gave the Samnites a total defeat, for which breach of discipline he was condemned to death by the dictator, but the sentence was not executed. Papirius, during the remainder of the campaign, applied himself to the recovering of the affections of his soldiers, which had been alienated by his severity, and then he attacked the enemy, who were reduced to sue for peace. He was chosen consul a second time in the year 320: and again a third time in the following year, when he reduced Satricum, which had revolted, and put all the Samnite garrison to the sword. For his exploits in this and the preceding campaign, triumphal honours were decreed him. In the consulate of Fabius Rullianus and Marcus Rutilius, B. C. 310, the latter having sustained great loss in an engagement with the Samnites, it was determined again to raise Papirius to the dictatorship, as the commander most to be relied on in the public danger. A decree was accordingly passed, enjoining Fabius to nominate Papirius to that high office. He was again successful, and received a third triumph. This was probably his last public service, as his name occurs no more in history. He surpassed all his contemporaries in military talents. In person he was tall and majestic, of great bodily strength and vigour, and so swift

of foot, that he obtained the surname from that circumstance. He kept his troops, as well as himself, in constant exercise, and maintained strict discipline. Univer. Hist. Livy.

PAPIRIUS CURSOR, the younger, son of the preceding, was created consul B. C. 293, in conjunction with Spurius Carvilius. In his contests with the Samnites he was very successful, and gave a proof of superiority to that superstition which was so prevalent among the early Romans. Being informed, as he was about to advance to battle, that the keeper of the sacred chickens had falsely given a favourable report of the augury derived from their eating, and that in fact the preface was inauspicious; he replied, that he should understand the report as it was given, and that if the keeper had deceived him, the vengeance of the gods would fall on him alone. He therefore placed the man in the front of the battle, where he was killed by an unknown hand before the armies came to a close engagement. The battle terminated in favour of the Romans: the Samnites were not only totally defeated, but lost their camp. For this and some subsequent success he obtained a triumph at the end of the campaign. Papirius, in his second consulate with the same colleague, was equally successful against the same people, which put an end to a war that had lasted for seventy-two years. The consuls next subdued the Lucanians and Bruttians, and proceeding to Tarentum, invested that city which had been the first to invite Pyrrhus into Italy. Papirius, by the offer of favourable terms, gained possession of the citadel, and the town soon surrendered, and became tributary. From this period nothing more occurs relating to this valiant commander. Univer. Hist.

PAPIRIUS, in *Botany*, see PAPIRIUS; also the misprinted name BROUSONNETRA.

PAPIST. Under this head, we shall present the reader, I. *With an account of the difference between Papists, reputed Papists, Popish Recusants, and Popish Recusants Convict*, in the legal acceptation of those words. II. *With a short view of the tenets of the Roman Catholic religion*, as distinguishable, 1st, into those which they consider as articles of their faith; 2dly, those which regulate their discipline; and, 3dly, the opinions of their private divines. III. *The laws enacted against them*, 1st, for the exercise of their own religious worship; 2dly, for not conforming to the religious worship of the state; 3dly, for their refusal to take the oath of supremacy; 4thly, for their refusal to take the sacrament of our Lord's supper; 5thly, for their refusal to take the declaration against transubstantiation; 6thly, for their refusal to take the declaration against popery; and, 7thly, the laws which affect their landed property. IV. The partial repeal of those acts, 1st, by act of the 18th; and, 2dly, by the act of the 31st of his present majesty. And, V. We shall close the article by a short mention of the penal laws, the effect of which is felt by the Roman Catholics, but the effect of which is not felt by the Protestant dissenters.

I. The word *Papist* came into use soon after the Reformation. From that time, the word "Protestant" was used to denote all descriptions of Christians, who were not in communion with the church of Rome; and the word "Papist" was used to denote that description of Christians, which remained in communion with her. It is to be observed, that, before the laws passed in the present reign, to repeal the principal penal laws in force against the Roman Catholics, the word "Papist" had a very extensive signification. In the language of the law, Papists are divided into five classes: *the mere Papist* was a person who had done those

acts, which amounted to legal evidence of Popistry; *the reputed Papist* was a person generally considered to have done such acts; *the Popish recusant* was a Papist, who absented himself from the Protestant church; *the Popish recusant convict* was a Papist legally convicted of such absence. Several statutes inflicted the penalties, legally incident to Popish recusancy, on the commission of certain acts, and the omission of others, into which the religious principles of Roman Catholics frequently led them; and thus constituted an *indirect recusancy*, the fifth and last species of Popistry, if it can be justly called by that name. But "Papist" was the general appellation given to the particular denomination of Christians, who are the subject of the present article. It was always considered by them to be a term of reproach, and they affected the appellation of Roman Catholics. In the oath, which passed in the year 1791, for the relief of the Roman Catholics, the person who takes it is made to say, "I. A. B., do hereby declare, that I do profess the Roman Catholic religion." Since the passing of that act, the name of Roman Catholic has been generally given them, and it now seems to be their proper legal appellation.

II. We shall now present the reader with a short view of the *tenets of the Roman Catholic religion*. They are distinguishable into, 1st, those which Roman Catholics consider to be the articles of their faith; 2dly, those which regulate their general discipline; and, 3dly, the opinions of their private divines.

All of them are thus stated and explained by the Rev. Joseph Berrington, a Roman Catholic priest, in his "State and Behaviour of the English Catholics, from the Reformation to the year 1780."

II. 1. "The following rule," says this intelligent writer, "is the grand criterion by which each article of our faith may be distinctly ascertained.

"This rule is:—All that, and only that, belong to Catholic belief, which is revealed in the word of God, and which is proposed by the Catholic church to all its members, to be believed with divine faith.

"Guided by this certain criterion, we profess to believe,

1. "That Christ has established a church upon earth; and that this church is that which holds communion with the see of Rome, being one, holy, Catholic, and apostolical.

2. "That we are obliged to hear this church; and therefore, that she is infallible, by the guidance of Almighty God, in her decisions regarding faith.

3. "That St. Peter, by divine commission, was appointed the head of this church, under Christ its founder; and that the pope or bishop of Rome, as successor to St. Peter, has always been, and is at present, by divine right, head of this church.

4. "That the canon of the Old and New Testament, as proposed to us by this church, is the word of God; as also such traditions, belonging to faith and morals, which, being originally delivered by Christ to his apostles, have been preserved, by constant succession, in the Catholic church.

5. "That honour and veneration are due to the angels of God, and his saints; that they offer up prayers to God for us; that it is good and profitable to have recourse to their intercession; and that the relics or earthly remains of God's particular servants are to be held in respect.

6. "That no sins ever were, or can be remitted, unless by the mercy of God, through Jesus Christ; and, therefore, that man's justification is the work of divine grace.

7. "That the good works which we do, receive their whole

PAPIST.

whole value from the grace of God; and that by such works we not only comply with the precepts of the divine law, but that we thereby likewise merit eternal life.

8. "That by works done in the spirit of penance, we can make satisfaction to God for the temporal punishment, which often remains due, after our sins, by the divine goodness, have been forgiven us.

9. "That Christ has left to his church power of granting indulgencies; that is, a relaxation from such temporal chastisements only, as remain due after the divine pardon of sin; and that the use of such indulgencies is profitable to sinners.

10. "That there is a Purgatory, or middle state; and that the souls of imperfect Christians, therein detained, are helped by the prayers of the faithful.

11. "That there are seven sacraments, all instituted by Christ: baptism, confirmation, eucharist, penance, extreme unction, holy orders, matrimony.

12. "That in the most holy sacrament of the eucharist, there is truly, really, and substantially, the body and blood, together with the soul and the divinity of our Lord Jesus Christ.

13. "That in this sacrament there is, by the omnipotence of God, a conversion or change of the whole substance of the bread into the body of Christ, and of the whole substance of the wine into his blood: which change we call transubstantiation.

14. "That, under either kind, Christ is received whole and entire.

15. "That in the mass or sacrifice of the altar is offered to God a true, proper, and propitiatory sacrifice for the living and the dead.

16. "That by the sacrament of penance, the sins we fall into, after baptism, are by the divine mercy forgiven us.

"These are the great points of Catholic belief, by which we are distinguished from other Christian societies; and these only are the real and essential tenets of our religion. We admit also of the other grand articles of revealed and natural religion, which the gospel and the light of reason have manifested to us. To these we submit, as men and as Christians; and to the former, as obedient children of the Catholic church.

II. 2. "There are *points of discipline* also, which regulate conduct, and to which we pay obedience; as fasting on particular days, communion in one kind, celibacy of churchmen, use of the Latin language in public service, and other similar practices. But as these vary, and may be either altered or suppressed by due authority, they belong not to what is properly styled the faith of Catholics.

III. 3. "*Opinions* also, whether regarding belief or practice, of particular schools, or of particular divines, constitute a distinct and separate object. Great latitude in the forming such opinions is allowed, and consequently it will be often abused. It has been in the power of some men to give an undue weight to such opinions, whereby Catholics themselves have been too often imposed on.

"They have ignorantly confounded the inventions of fallible men with the unerring declarations of heaven. Of this circumstance our enemies have many times taken an unfair advantage, and the faith of Catholics has suffered from the false representation. Some opinions may deserve respect, but others should be despised and reprobated.

"And it should be noticed, that most of the charges brought against us are founded on this false supposition, that the opinions of private men, or of whole societies, are as much a part of our real creed, as the articles I have mentioned. When all this extraneous matter, whether of dis-

cipline or of opinion, is brought to a proper test, by the rule of faith I so much insist on, it will soon appear in what light it is to be considered. Were I to reject every opinion, hitherto discovered, and solely adhere to the articles of doctrine as above stated, I should be a Catholic in the strict and accurate acceptation of the word. Divines might censure me, casuists might defame me, and the pope might deny me the name of Papist; but my faith would still be pure, unimpaired, and Catholic."

Thus far Mr. Berrington.—We trust that the passage which we have cited from his work, gives a correct view of the religious creed and opinions of the Roman Catholics. Those, who wish to be more fully acquainted with them, should peruse Bossuet's "Exposition of the Catholic Faith," and the Rev. Mr. Gotter's "Papist misrepresented and represented on a twofold Character of Popery." The last work was first published in 1685: it is become scarce; but an abridgment of it, now in its 17th edition, is very common, and is generally referred to by Roman Catholics, as an excellent epitome of their religious tenets, and a complete exposure of the misrepresentations of them.

III. The history of the English Catholics, as a distinct body of Dissenters, begins with the reign of Elizabeth. In the course of her reign many oppressive, and even sanguinary laws were enacted against them. The justice and policy of those laws scarcely find at this time a single advocate. But when they were enacted they found their defenders; and none among them, none more able than lord treasurer Burleigh, who published, or rather caused to be published, in their defence, a book entitled "The Execution of Justice," in which he attempted to shew, that the Catholic priests, executed in the reign of queen Elizabeth, were not executed for their religion, but for treasonable practices. In answer to it cardinal Allen published his true modest "Defence of the English Catholics." The subject was revived in our times by Dr. Sturges' "Reflections on Popery." To those, Dr. Milner opposed his "Letters to a Prebendary;" one of the most successful works that has appeared in defence of the Roman Catholics. A discussion of this controversy would be misplaced in a work like the present. We shall only mention that, by a succession of legislative enactments during the reigns of queen Elizabeth, of the three first Stuart monarchs, and of the three monarchs who filled the throne from the abdication of king James II. to the accession of king George II. the Catholics were subjected to the heaviest pains, penalties, and disabilities. The laws by which they were inflicted may be reduced under five heads.

III. 1. The first are those which subjected them to penalties and punishments for exercising their religious worship; under which head may be ranked the laws respecting their education, and the ministers of their church. By these laws, if an English priest of the church of Rome, born in the dominions of the crown of England, came to England from beyond the seas, or tarried in England three days without conforming to the church, he was guilty of high treason; and those incurred the guilt of high treason, who were reconciled to the see of Rome, or procured others to be reconciled to it. By these laws also, Papists were totally disabled from giving their children any education in their own religion; for if they educated their children at home; then, for maintaining the school-master, if he did not repair to church, or was not allowed by the bishop of the diocese, they were liable to forfeit 10*l.* a-month, and the school-master was liable to forfeit 40*l.* a-day. And if they sent their children for education to any school of their persuasion abroad, they were liable to

forfeit 100*l.* and the children, so sent, were disabled from inheriting, purchasing, or enjoying any lands, profits, goods, debts, duties, legacies or sums of money. Saying mass was punishable by a forfeiture of 200 marks; hearing it by a forfeiture of 100. See 1 Eliz. c. 2. 23 Eliz. c. 1. 27 Eliz. c. 2. 29 Eliz. c. 6. 35 Eliz. c. 2. 2 Jac. I. c. 4. 3 Jac. I. c. 4. 5. 7 Jac. I. c. 6. 3 Car. I. c. 2. 25 Car. II. c. 2. 7 & S.W. 3. c. 27. 1 Geo. I. c. 13.

III. 2. Under the second head, were those laws which punished the English communicants with the church of Rome, for not conforming to the established church. These are generally called the Statutes of Recusancy. It should be observed, that absence from church alone, and unaccompanied by any other act, constituted recusancy, in the true sense of that word. Till the statute of 35 Eliz. c. 2, all nonconformists were considered as recusants, and were all equally subject to the penalties of recusancy. That statute was the first penal statute made against Popish recusants by that name, and as distinguished from other recusants. From that statute arose the distinction between Protestant and Popish recusants; the former were subject to such statutes of recusancy as preceded that of the 35th of queen Elizabeth, and to some statutes against recusancy made subsequently to that time; but they were relieved from them all by the Act of Toleration in the first year of king William's reign. From 35 Eliz. c. 2, arose also the distinction between Papists, and persons professing the Popish religion, and Popish recusants, and Popish recusants convicted.

By the statutes against Popish recusants convicted, they were punishable by the censures of the church, and by a fine of 20*l.* for every month, during which they absented themselves from church; they were disabled from keeping arms in their houses; from maintaining actions, or suits at law, or in equity; from being executors or guardians; from presenting to advowsons; from practising in the law, or physic; and from holding offices, civil or military; they were subject to the penalties attending excommunication; were not permitted to travel five miles from home, unless by licence, upon pain of forfeiting all their goods; and might not come to court under pain of 100*l.* A married woman, when convicted of recusancy, was liable to forfeit two-thirds of her dower or jointure: she could not be executrix or administratrix to her husband, or have any part of his goods, and during her marriage she might be kept in prison, unless her husband redeemed her at the rate of 10*l.* a-month, or the third part of his lands. Popish recusants convicted were, within three months after conviction, either to submit and renounce their religious opinions, or, if required by four justices, to abjure the realm; and, if they did not depart, or if they returned without a licence, they were guilty of felony, and were to suffer death as felons. See the statutes referred to under the former head.

III. 3. As to the penalties or disabilities attending the refusal of Roman Catholics to take the oath of supremacy, the declaration against transubstantiation, and the declaration against Popery; it must be premised, that the Roman Catholics make no objection to take the oath of allegiance (1 Geo. II. c. 13.), or the oath of abjuration (6 Geo. III. c. 53.) With respect to the oath of supremacy, by 1 Eliz. c. 1, the persons therein mentioned were made compellable to take the oath of supremacy, contained in that act. By the third of king James I. c. 4, another oath was prescribed to be taken, commonly called the "Oath of Allegiance and Obedience." These oaths were abrogated by the first of king William and queen Mary sess. 1. c. 8, and a new oath of allegiance, and a new oath of supremacy, were introduced

and required to be taken in their stead. The statute made in the second session of the first year of king George I. c. 13. contains an oath of supremacy, in the same words as the oath of supremacy, required to be taken by the first of king William and queen Mary. By that oath persons are made to swear, "That no foreign prince, person, prelate, state, or potentate, hath, or ought to have, any jurisdiction, power, supremacy, pre-eminence or authority, ecclesiastical or spiritual, within the realm." It was required to be taken by the persons therein named; it might be tendered to any person, by any two justices of the peace, and persons refusing the oath so tendered, were adjudged to be Popish recusants convicted, and to forfeit and be proceeded against, as such. This was the constructive recusancy referred to above. It was not the offence itself of recusancy, which, as we have already observed, consisted merely in the party's absenting himself from church; it was the offence of not taking the oath of supremacy, and the other oaths prescribed by the act of 1 Geo. I. the refusal of which was, by that statute, placed on the same footing as a legal conviction on the statutes of recusancy, and subjected the party refusing to the penalties of those statutes. This was the most severe of all the laws against Papists.

The punishment of recusancy was penal in the extreme; and the persons objecting to the oath in question, might be subjected to all the penalties of recusancy, merely by their refusing the oath when tendered to them. It added to the penal nature of these laws, that the oath in question might be tendered at the mere will of two justices of peace, without any previous information or complaint before a magistrate or any other person. Thus, by refusing to take the oath of supremacy, when tendered to them, they became liable to all the penalties of recusancy; and the same refusal, by 7 & S.W. III. c. 4. and 1 Geo. I. st. 2. c. 13, restrained them from practising the law as advocates, barristers, solicitors, attorneys, notaries, or proctors, and from voting at elections.

III. 4. With respect to receiving the sacrament of our Lord's supper; by 13 Car. II. (commonly called the Corporation Act,) no person can be legally elected to any office relating to the government of any city or corporation, unless, within a twelvemonth before, he has received the sacrament of the Lord's supper according to the rites of the church of England; and he is also enjoined to take the oaths of allegiance and supremacy, at the same time that he takes the oath of office, or in default of either of these requisites such election shall be void.

III. 5. As to the declaration against transubstantiation, by 25 Car. II. c. 2. (commonly called the Test Act,) all officers, civil or military, are directed to take the oath, and make the declaration against transubstantiation, in the court of King's Bench or Chancery, the next term or at the next quarter sessions, or, (by subsequent statutes,) within six months after their admission; and also, within the same time, to receive the sacrament of the Lord's supper, according to the usage of the church of England, in some public church immediately after divine service and sermon; and to deliver into court a certificate thereof, signed by the minister and churchwardens, and also to prove the same by two credible witnesses, upon forfeiture of 500*l.* and disability to hold the office.

III. 6. With respect to the declaration against Popery; the act passed in the 30th year of Car. II. stat. 2. c. 1. contains the declaration, and prescribes it to be made by members of either house of parliament, before they take their seats; by it they declare their disbelief of the doctrine of transubstantiation; and their belief that the invocation of saints and the sacrifice of the mass are idolatrous.

III. 7. With respect to the *laws affecting their landed property*. How this was affected by the laws against recusancy has been already mentioned. By the 11 & 12 W. III. c. 4. it was enacted that a person educated in the Popish religion, or professing the same, who did not, in six months after the age of sixteen, take the oaths of allegiance and supremacy, and subscribe the declaration of 30 Car. II., should, in respect of himself only, and not of his heirs, or posterity, be disabled to inherit or take lands by descent, devise, or limitation, in possession, reversion, or remainder: and that during his life, till he took the oaths, and subscribed the declaration against popery, his next of kin, who was a Protestant, should enjoy the lands without accounting for the profits, and should be incapable of purchasing; and that all estates, terms, interests, or profits, out of lands, made, done, or suffered, to his use, or in trust for him, should be void. By 3 Jac. I. c. 5. 1 W. & M. c. 26. 12 Anne stat. 2. c. 14. 11 Geo. II. c. 17. Papists, or persons professing the Popish religion, were disabled from presenting to advowsons, and other ecclesiastical benefices, and to hospitals and other charitable establishments. By annual acts of the legislature, Papists, being of the age of eighteen years, and not having taken the oaths of allegiance and supremacy, were subjected to the burthen of the double land tax.

By a statute made in the second session of the first year of Geo. I. c. 55, they were required to register their names and estates in the manner and under the penalties therein mentioned; and by 3 Geo. I. c. 18. continued by several subsequent statutes, an obligation of enrolling their deeds and wills was imposed on them. Such were the principal penal laws against Roman Catholics, "*imensus aliarum super alias acervatarum legum cumulus*," (Liv. 3. 34.) at the time of the accession of the house of Brunswick.

IV. To the enlightened and humane temper of the times during the reign of his present majesty, his Roman Catholic subjects are wholly indebted for any repeal of this large and grievous code. *Two acts have been already passed for their relief.*

IV. 1. *The first of those acts was passed in the 18th year of his majesty's reign.* It enacted, that so much of the 11 & 12 W. III. as related to the prosecution of Popish priests and Jesuits, and imprisoning Papists who keep schools, or to disable Papists from taking by descent or purchase, should be repealed as to all Papists, or persons professing the Popish religion, who, within six months after the passing of the act, or their coming of age, should take the oath prescribed by the act.

This act was an essential benefit to Roman Catholics; but its best effect in their regard, was its operation on the public mind, by lessening the prejudices generally entertained against them, and bringing them and their fellow-subjects into habits of social intercourse and amity, which the penal code had too much interrupted. It can only be conceived by those who witnessed it, what a sudden and extensive effect, in this regard, was produced by this single act of parliament.

IV. 2. A more extensive relief from the penal laws was granted to the English Roman Catholics by an act of the 31st year of the reign of his present majesty. The extent and the conditions of this relief will be stated under the article TOLERATION.

V. It remains to give some account of the penal laws, the effect of which is felt by Roman Catholics, but the effect of which is not felt by Protestant dissenters.

V. 1. It has been already shewn, how the law stands on

the Corporation and Test Acts. The statute of the 1st William and Mary, (commonly called the Toleration Act), exempts all Dissenters, except Papists, and such as deny the Trinity, (with regard to whom an alteration has lately taken place, see TRINITY,) from all penal laws relating to religion, provided they take the oaths of allegiance and supremacy, and subscribe the declaration against popery, and repair to some congregation registered in the bishop's court or at the sessions. But there is nothing in this act which dispenses, either with the Test Act or the Corporation Act, so far as they impose the obligation of receiving the Lord's supper on persons serving in offices, or elected to serve in corporations. With respect, therefore, to the Test Act and the Corporation Act, these are the only acts which subject the Protestant dissenters to any penalties or disabilities. To these the Roman Catholics are subject, equally with the Protestant dissenters. There is, therefore, no penalty or disability that affects the Protestant dissenters, to which Roman Catholics are not subject equally; but there still remain several penal laws, the effect of which is most severely felt by Roman Catholics, but the effect of which is not, in any manner, felt by Protestant dissenters.

V. 2. The first of these is the 30th Car. II. stat. 2. c. 1. which provides that no person should sit or vote in the house of peers, or be a member of, or sit or vote in the house of commons, till he has taken the oaths of allegiance and supremacy, and made and signed the declaration against popery.

V. 3. By the 7th and 8th of W. III. c. 27, those, who refuse to take the oath of supremacy, tendered to them at the requisition of a candidate, are disabled from voting at elections.

V. 4. By several statutes, Roman Catholics are disabled from presenting to advowsons. This disability is peculiar to them; Quakers, and even Jews, having the full enjoyment of the right of presentation.

V. 5. Lastly, Roman Catholics alone feel the penal operation of 1 Geo. I. stat. 2. c. 13, which requires all persons, bearing offices, civil or military, or holding command or place of trust, or receiving pay or wages, by reason of any patent or grant from his majesty, to take the oath of supremacy under the penalty of 500*l.* and under other penalties.

Such are the penal laws under which the Roman Catholics of England still labour. They have presented petitions to both houses of parliament for their repeal, and we wish them success: but we still more anxiously wish for that time, when the imperial parliament of the united empire will see the injustice and impolicy of every restriction on religious opinion, and at once abolish the whole religious penal code.

The Declaration and Protestation signed by the English Catholics in 1789.

We, whose Names are hereunto subscribed, CATHOLICS of ENGLAND, do freely, voluntarily, and of our own accord, make the following solemn DECLARATION and PROTESTATION.

Whereas sentiments unfavourable to us, as citizens and subjects, have been entertained by English Protestants, on account of principles which are asserted to be maintained by us and other Catholics, and which principles are dangerous to society, and totally repugnant to political and civil liberty; — it is a duty that we, the English Catholics, owe to our country as well as to ourselves, to protest, in a formal and solemn manner, against doctrines that we condemn, and that constitute no part whatever of our principles, religion, or belief.

We are the more anxious to free ourselves from such imputations, because divers Protestants, who profess themselves to be real friends to liberty of conscience, have, nevertheless, avowed themselves hostile to us, on account of certain opinions which we are supposed to hold. And we do not blame these Protestants for their hostility, if it proceeds (as we hope it does) not from an intolerant spirit in matters of religion, but from their being misinformed as to matters of fact.

If it were true, that we, the English Catholics, had adopted the maxims that are erroneously imputed to us, we acknowledge that we should merit the reproach of being dangerous enemies to the state; but, we detest those unchristianlike and execrable maxims: and we severally claim, in common with men of all other religions, as a matter of natural justice, that we, the English Catholics, ought not to suffer for or on account of any wicked or erroneous doctrines that may be held by any other Catholics, which doctrines we publicly disclaim, any more than British Protestants ought to be rendered responsible for any dangerous doctrines that may be held by any other Protestants, which doctrines they, the British Protestants, disavow.

First, We have been accused of holding, as a principle of our religion, that princes excommunicated by the pope and council, or by authority of the see of Rome, may be deposed or murdered by their subjects, or other persons.

But, so far is the above mentioned unchristian-like and abominable position from being a principle that we hold, that we reject, abhor, and detest it, and every part thereof, as execrable and impious: and we do solemnly declare, that neither the pope, either with or without a general council, nor any prelate, nor any priest, nor any assembly of prelates or priests, nor any ecclesiastical power whatever, can absolve the subjects of this realm, or any of them, from their allegiance to his majesty king George the Third, who is, by authority of parliament, the lawful king of this realm, and of all the dominions thereunto belonging.

Second, We have also been accused of holding, as a principle of our religion, that implicit obedience is due from us to the orders and decrees of popes and general councils; and that therefore if the pope, or any general council, should, for the good of the church, command us to take up arms against government, or by any means to subvert the laws and liberties of this country, or to exterminate persons of a different persuasion from us, we (it is asserted by our accusers) hold ourselves bound to obey such orders or decrees, on pain of eternal fire:

Whereas, we positively deny that we owe any such obedience to the pope and general council, or to either of them; and we believe that no act that is in itself immoral or dishonest can ever be justified by or under colour that it is done either for the good of the church, or in obedience to any ecclesiastical power whatever. We acknowledge no infallibility in the pope; and we neither apprehend nor believe that our disobedience to any such orders or decrees (should any such be given or made) could subject us to any punishment whatever. And we hold and insist, that the Catholic church has no power that can, directly or indirectly, prejudice the rights of Protestants, inasmuch as it is strictly confined to the refusing to them a participation in her sacraments and other religious privileges of her communion, which no church (as we conceive) can be expected to give to those out of her pale, and which no person out of her pale will, we suppose, ever require.

And we do solemnly declare, that no church, nor any prelate, nor any priest, nor any assembly of prelates or priests, nor any ecclesiastical power whatever, hath, have, or ought

to have, any jurisdiction or authority whatsoever within this realm, that can, directly or indirectly, affect or interfere with the independence, sovereignty, laws, constitution, or government thereof; or the rights, liberties, persons, or properties of the people of the said realm, or of any of them, save only and except by the authority of parliament; and that any such assumption of power would be an usurpation.

Third, We have likewise been accused of holding, as a principle of our religion, that the pope, by virtue of his spiritual power, can dispense with the obligations of any compact or oath taken or entered into by a Catholic: that therefore no oath of allegiance, or other oath, can bind us; and, consequently, that we can give no security for our allegiance to any government.

There can be no doubt but that this conclusion would be just, if the original proposition upon which it is founded were true; but, we positively deny that we do hold any such principle. And we do solemnly declare, that neither the pope, nor any prelate, nor any priest, nor any assembly of prelates or priests, nor any ecclesiastical power whatever, can absolve us, or any of us, from, or dispense with, the obligations of any compact or oath whatsoever.

Fourth, We have also been accused of holding, as a principle of our religion, that not only the pope, but even a Catholic priest, has power to pardon the sins of Catholics at his will and pleasure; and therefore, that no Catholic can possibly give any security for his allegiance to any government, inasmuch as the pope, or a priest, can pardon perjury, rebellion, and high treason.

We acknowledge also the justness of this conclusion, if the proposition upon which it is founded were not totally false. But, we do solemnly declare, that, on the contrary, we believe that no sin whatever can be forgiven at the will of any pope, or of any priest, or of any person whomsoever; but that a sincere sorrow for past sin, a firm resolution to avoid future guilt, and every possible atonement to God and the injured neighbour, are the previous and indispensable requisites to establish a well-founded expectation of forgiveness.

Fifth, And we have also been accused of holding, as a principle of our religion, that 'no faith is to be kept with heretics;' so that no government which is not Catholic can have any security from us for our allegiance and peaceable behaviour.

This doctrine, that 'faith is not to be kept with heretics,' we reject, reprobate, and abhor, as being contrary to religion, morality, and common honesty: — and we do hold and solemnly declare, that no breach of faith with any person whomsoever can ever be justified by reason of or under pretence that such person is an heretic or an infidel.

And we further solemnly declare, that we do make this Declaration and Protestation, and every part thereof, in the plain and ordinary sense of the words of the same, without any evasion, equivocation, or mental reservation whatsoever.

And we appeal to the justice and candour of our fellow citizens, whether we, the English Catholics, who thus solemnly disclaim, and from our hearts abhor, the above mentioned abominable and unchristian-like principles, ought to be put on a level with any other men who may hold and profess those principles?

The above Declaration and Protestation was signed by one thousand seven hundred and forty persons; including several peers, and two hundred and forty-one clergymen of the Catholic religion.

PAPIUCHI, in *Geography*, a town of Mexico, in the province of Mayo; 150 miles N. of Santa Cruz.

PAPLAH, a town of Asia, and capital of a small country, dependent upon Thibet; governed by a rajah; 90 miles N. of Fyzabad. N. lat. 28° 10'. E. long. 82° 53'.

PAPOUL, ST., a town of France, in the department of the Aude, before the revolution the see of a bishop; four miles E. of Castelnaudary. N. lat. 43° 20'. E. long. 2° 7'.

PAPOZZE', a town of Italy, in the department of the Lower Po; 22 miles N.E. of Ferrara.

PAPPAW, a town of Prussia, in the palatinate of Culm; 10 miles S.E. of Culm.

PAPPENBURG, a sea-port town of East Friesland, on a canal which communicates with the Ems. Although it has been lately erected, it contains 19 yards for ship-building, 2 churches, 400 houses, and 3000 inhabitants. To this port belong 160 vessels, the largest of which carry 160 lasts, with about 100 small craft; 20 miles S. of Emden. N. lat. 53°. E. long. 7° 28'.

PAPPENHEIM, a town of Bavaria, and capital of a county, in the bishopric of Aichstatt, on the Altmuhl. The established and universal religion is Lutheranism; 12 miles N.W. of Aichstatt.

PAPPON, JOHN PETER, in *Biography*. was born in the year 1736, at Pujes, near Nice. He entered while he was young into the congregation of the Oratory, and became a distinguished member. He passed life in tranquillity, exempt from ambition and intrigue, and his spirits were scarcely affected by the loss of pension, which constituted his chief support, at the commencement of the revolution. During the reign of the infamous Robespierre, he took refuge in the department of the Puy-de-Dôme, whence he afterwards returned to Paris. He died in 1801, in the sixty-fifth year of his age. His principal works are as follow; "An Ode to Death," inserted in the collection of the Floral Games of Toulouse; "L'Art du Poete et de l'Orateur;" "Voyage de Provence," 2 vols. 12mo.; "Histoire de Provence," 4 vols. 4to. He wrote some pieces relative to the French revolution, and a work entitled "Epoques memorables de la Peite," in two vols. 8vo. To the history of Provence many ancient documents were annexed; and for the purpose of discovering new authorities the author took a journey to Naples, and procured, among other pieces, the Quittance given by queen Joan to pope Clement VI. for the price of Avignon, which she sold him.

PAPPOPHORUM, in *Botany*, a genus first established by Schreber, and named by him from *παππος*, *thistle down*, and *φειω*, *to bear*, in allusion to the peculiar resemblance of the fine aggregate awns of this grass, to the seed-down of many Syngenesious plants. Schreb. 787. Willd. Sp. Pl. v. 1. 458. Mart. Mill. Dict. v. 3. Brown Prodr. Nov. Holl. v. 1. 184. Lamarck Dict. v. 5. 3. Clafs and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume of two long, linear, somewhat compressed, very thin, pointed, awnless valves, containing two florets; the outermost valve a little shorter. *One floret* below the other, larger, sessile, bearded at the base, perfect; the *second* raised upon a short stalk, smaller, pressed close to the back of the former, beardless, neuter; above these is the rudiment of a third, sometimes of a fourth. *Cor.* Glume of two valves, shorter than the calyx; the outermost ovate, swelling, angular, terminated by numerous, nine to thirteen, very long, straight, unequal, feathery or rough, spreading awns, its edges embracing the inner glume, which is lanceolate, acute, rather longer and narrower than the outer. Nectary minute, of two linear leaves. *Stam.* Filaments three, capillary; anthers oblong. *Pist.* Germen ovate, superior; styles two, short; stigmas villous. *Peric.*

none, except the corolla, which encloses the seed, but is not united to it. *Seed* solitary, ovate, compressed, pelucid.

Ess. Ch. Calyx of two linear, nearly equal, valves, containing two florets, with the rudiments of more. Corolla of two valves, the outermost with numerous awns.

Obf. The outer glume of the lowermost floret is villous at the back and sides; the inner glume is hollowed out at the back, for the reception of the upper, or neuter, floret. The awns have the appearance of the down of the seeds of syngenesious flowers. Schreb.

1. *P. alopecuroideum*. Vahl. Symb. v. 3. 10. t. 51. (Saccharum pappiferum; Lamarck Illustr. v. 1. 155.)—Awns thirteen, minutely toothed.—Native of South America. *Root* perennial. *Stem* branched, three or four feet high, smooth. *Leaves* convoluted, acute, striated, shorter than the stem. *Panicle* or *spike* erect, compound, eighteen inches long, resembling that of *Agrostis panicea*, Willd. Sp. Pl. v. 1. 363. Engl. Bot. t. 1704. Willd. The calyx, according to Vahl, contains sometimes four florets, though only one is perfect.

2. *P. nigricans*. Brown n. 1.—Awns nine, feathery. *Spike* compound, somewhat cylindrical, with imbricated lobes. *Glumes* very finely downy. *Leaves* and sheaths naked, roughish. Gathered by Mr. Brown, in the tropical as well as southern parts of New Holland, and at Port Jackson.

3. *P. pallidum*. Br. n. 2.—Awns nine, feathery. *Spike* compound, somewhat cylindrical, with imbricated lobes. *Glumes* and *leaves* villous.—Native of the tropical part of New Holland, as well as the two following, Mr. Brown having gathered them all in that country.

4. *P. purpurascens*. Br. n. 3.—Awns nine, feathery, coloured. *Spike* lanceolate, lobed; its branches alternate, racemose. *Glumes* and *leaves* downy.

5. *P. gracile*. Br. n. 4.—Awns nine, feathery. *Spike* divided in the lower part; simple above. *Glumes* downy. *Leaves* involute, smooth, as well as the stems.

We have taken the specific characters of all the five species from Mr. Brown, having seen no specimen of any of them.

PAPPOSE PLANTS, in *Gardening*, are all those which have a downy kind of flowers, or a sort of feathery crown of the same nature, which adheres to the seeds of many of them, as are exemplified in the lettuce, the dandelion, the sow-thistle, groundsel, and some other sorts. A great many of these kinds of plants also produce compound flowers, the seeds of which are furnished with a portion of this downy substance adhering to the top part of each, so as in some degree to resemble a shuttle-cock, being naturally framed for flying, in order to spread and disseminate the seed, and transport it to considerable distances by the wind, so that it may be sown and deposited in different soils and situations, instead of being confined to a single spot.

Among this class of plants are some of the most troublesome weeds, the seeds of which are, by the means which they thus possess, carried and scattered in the gardens and fields, to the great inconvenience and trouble of the gardener and farmer.

These are likewise frequently called winged seeds. See the following article, and WEEDS.

PAPPUS, in *Botany* and *Vegetable Physiology*, Seed-down; the hairy or feathery, sometimes chaffy, radiating crown of the seed, in the natural order of Compound Flowers, or Syngenesious class, such being the true classical acceptation of this Latin word, as well as of the Greek *παππος*, from whence it comes. The use of this part is to waft the seed to a distance, in dry and windy weather, when the *pappus* is most light and expanded; by which means such

such plants are widely dispersed. Finally it either slips off, by the drying and contraction of the summit of the seed, as in Thistles; or the seed having fixed itself in the earth, the down is broken off by the wind, or some other accidental cause; in either case the seed is left behind, to germinate without further disturbance. The down, having fulfilled its primary destination, often serves a secondary purpose in the economy of nature; being hoarded up by birds, and the smaller quadrupeds, to compose or to line their nests, or winter retreats. Its texture is not such as to render it fit for being woven, by human art, for any use.

Gærtner properly restrains the term *pappus* to compound flowers; though Linnæus and others use it indiscriminately for such, and for the hairy appendages to the top, sides, or base, of other seeds, even when they are enclosed in a capsule; witness *Epilobium*, *Aselepias*, and many others of the *Contortæ*, *Salix*, *Eriophorum*, &c. Gærtner uses the word *Coma*, when such an appendage is situated at the top of the seed; *Pubes* when it originates from the base or sides, as in *Gossypium*, the Cotton plant.

The proper *Pappus* of syngenesious compound flowers is either stalked, as in the Common Dandelion, or sessile, as in the Thistle; in both which examples its rays are of a feathery structure. In *Hieracium* the rays are, or ought to be, simple; but such a structure is very rare, what are so described being for the most part rough or toothed, at least, if not more or less branched or feathery. In *Cichorium*, and several other genera, the *pappus* consists of dilated chaffy teeth, or leaflets, either separate or combined at their base, which clearly shews the affinity of the part to a calyx. This more strikingly appears in *Scabiosa*, in which the term is admitted, even by Gærtner, that genus having compound, though not syngenesious, flowers. Here the *pappus* is double, very variously and curiously constructed in the different species. *Bidens* has a *pappus* of two, three, or four rigid barbed bristles, evidently contrived so for the purpose of attaching the seeds to the coats of animals, or to any thing else that may come in the way, in order to aid in their dispersion by that means, instead of their being wafted on the wings of a light feathery seed-down. The variety of structure in the part in question is indeed highly curious, some plants having two sorts of *pappus* to the different florets of the same flower; see HEDYPSOIS. A judicious, but not indiscriminate, attention to its differences, affords one of the best clues to a knowledge of the syngenesious genera; but in this as well as other cases no difference must be considered as absolute; the genus always being required to give the character, not the character the genus.

PAPPUS, in *Biography*, a very eminent Greek mathematician of Alexandria, who flourished in the fourth century, during the reign of Theodosius the Great, who presided over the empire from the year 379 to 395. Such of his works as are still extant, prove that he was profoundly skilled in the mathematical sciences: the greater part of his productions are probably lost, among which are a "Commentary upon Ptolemy's Almagest;" "A Description of the Rivers of Lybia;" "An Universal Chorography;" a treatise "On Military Engines;" "Commentaries upon Aristarchus of Samos, concerning the Magnitude and Distance of the Sun and Moon." Reference is made by Marinus, a disciple of Proclus, to his "Mathematical Collections," in eight books, of which the last six, and part of the second remain. They were among the manuscripts presented by sir Henry Saville to the Bodleian library at Oxford. To this work, Marcus Meibonius annexed some *lemmata*, from the seventh book, in Greek, with a version of his own, to his "Dialogue on Proportions," published at Copenhagen in the year 1665;

and Dr. Wallis printed the last twelve propositions in Greek, from the Savilian MS. with a Latin version and notes at the end of his edition of Aristarchus' treatise "On the Magnitude and Distance of the Sun and Moon;" and also in the third volume of his "Mathematical Works." In the year 1703, Dr. David Gregory gave part of the preface to the seventh book, in which the author treats of the geometrical analysis of the ancients, &c. in Greek, accompanied with the Latin version of Commandini, in the *Prolegomena* to his edition of Euclid; and in 1706 Dr. Edmund Halley printed the whole preface, in Greek and Latin, in the *Prolegomena* to his edition of the *Conics* of Apollonius. And, to mention no other instances of a like kind, we may observe, that the whole of what remains of the "Mathematical Collections," was published at Bologna in 1660. For an analysis of these collections, we refer to Hutton's dictionary, art. *Pappus*.

PAPRA, in *Geography*, a town on the W. coast of Siam. N. lat. 8° 10'. E. long. 98° 30'.

PAPREMIS, or PAPIRIMIS, in *Ancient Geography*, a town of Egypt, and the capital of the Papremite nome. In this place the hippopotamus was regarded as a sacred animal; and Mars was honoured with a singular ceremony. Upon the festival appropriated to this deity, the priests bore upon a four-wheeled chariot the statue of the god, which was enclosed in a small chapel of gilt wood; and while they endeavoured to force the chariot and statue into the temple of that divinity, men armed with clubs stood in the way to hinder it; and as the priests who accompanied the procession had likewise arms, there ensued an engagement, when naturally many people must have lost their lives. The Egyptians, however, maintained that nobody died of the wounds they received upon that occasion.

PAPS, in *Geography*, the two remarkable mountains of the county of Kerry, Ireland, about eight miles E. by S. from Killarney.—Also, two remarkable hills of Upper Canada, on the N. shore of lake Superior.

PAPUA. See *New GUINEA*.

PAPUDA BAY, a bay on the coast of Chili, in the South Pacific ocean, five leagues N. of the shoals of Quintaro and four from port Liga; the water is deep, the anchorage good, and the entrance safe.

PAPULA, in *Medicine*, a diminutive of *papa*, the *nipple*, signifies a small, hard, and acuminate elevation of the surface of the skin, which has an inflamed base, but seldom contains a fluid, or tends to suppurate. It is synonymous with the English term *pimple*.

This appellation has been applied by medical writers to a considerable variety of eruptions; but, in the more accurate nomenclature of cutaneous diseases, adopted by the late Dr. Willan, its signification is limited, as above, to a minute tumour, which appears to originate in an inflammation of the papillæ of the skin, by which these are enlarged, elevated, and indurated, and made to assume more or less of a red colour; they do not end in suppuration like pustules, but commonly terminate in a scurfy exfoliation of the cuticle. The most accurate nosologists, indeed, seem to have agreed in restricting the meaning of the word to this sense. Thus Sauvages defines *papula*, "Phyma parvulum, desquamari solitum." (Nosol. Method. c. 1. i. Synopf. ord. ii. 6. See also Linnæi, Gen. Morbor. class. xi. ord. 4.) Among the ancients, Celsus seems to have understood the term in the same acceptation, although he applies it generically, apparently to the lichen. De Medicina, lib. v. cap. 28.

The *papular* eruptions constitute the first order in Dr. Willan's ingenious classification of diseases of the skin; and of these he has described three distinct genera; namely, the STROPHULUS, *red-gum*, or *tooth rash*, of children; the LI-

CHEN,

CHEN, and the PRURIGO, which see respectively. See also Willan on Cutaneous Diseases; and Bazeman's Practical Synopsis of Cutaneous Diseases, p. xx.

PAPULARIA, in *Botany*, so termed by Forskall, in his *Fl. Ægypt. Arab.* 69, on account of the crystalline soft granulations sprinkled over its leaves, is no other than *Triantenna monogyna*. See PAPPILLOSUM *folium*, and TRIANTHEMA.

PAPYRIUS, from *papyrus*, Lamarck *Illustr.* t. 762, a name given by that author to the Paper Mulberry, in allusion to the use made of its bark, from which most of the East Indian, Japanese, and Chinese paper is prepared, as well as the cloth of Otaheite, &c. This plant, confounded by Linnæus under *Morus*, was separated from thence, as a distinct genus, by l'Heritier, who called it *Broussonetia*, in honour of his friend P. M. Augustus Broussonet, M. D. an excellent botanist and ichthyologist, who first introduced this valuable tree alive into the French gardens. He was also one of the most zealous disciples of the Linnæan school in that country, and an undisguised opponent of those, who, from envy or prejudice, depreciated the merits of the great naturalist of Sweden. Hence it seems that Lamarck was not inclined to adopt the name l'Heritier had proposed, if he was actually acquainted therewith, and he retaliated that sort of neglect or opposition which he had, in many instances, received from his rival. Ventenat, however, and Willdenow, have restored *Broussonetia*, which has every claim to preference, and it is adopted in this country, where the merits and amiable character of Dr. Broussonet are well known to several, who have sincerely deplored the misfortunes which, like many good Frenchmen, he experienced under Robespierre, and his subsequent untimely death. One of our predecessors has passed over this name; see BROUSSONNETIA, as it is very erroneously printed. We beg leave here to assert its just claims, though out of its alphabetical place.

BROUSSONETIA. l'Herit. MSS.—Venten. *Tabl.* v. 3. 547. *Andr. Repof.* v. 7. 488. *Willd. Sp. Pl.* v. 4. (Papyrus; *Lam. Illustr.* t. 762. *Poiret in Lam. Dict.* v. 5. 3.)—Class and order, *Diacia Tetrandria*. *Nat. Ord. Scabridæ*, Linn. *Urticæ*, Juss.

Gen. Ch. Male, *Cal.* Perianth in four deep, ovate, concave segments. *Cor.* none. *Stam.* Filaments four, awl-shaped, erect, much longer than the calyx, opposite to its segments; anthers oval, of two cells.

Female, on a separate plant, *Cal.* Perianth inferior, tubular, of one leaf, with four, rarely but three, segments, permanent. *Cor.* none. *Pist.* Germen somewhat stalked, ovate, compressed; style lateral, awl-shaped, elongated, permanent; stigma simple. *Peric.* none, except the elongated, pulpy, coloured, forked, club-shaped receptacle, on which the seed is elevated as on a stalk, and enclosed between its points. *Seed* solitary, ovate, partly covered by the forks of its pulpy supporter, and accompanied by the capillary withered style. *Common receptacle* globose, very densely covered with flowers spreading every way, and interspersed bristly permanent scales.

Ess. Ch. Male, Calyx in four deep segments, Corolla none.

Female, Calyx tubular, in four segments. Corolla none. Style one, lateral. Seed solitary, elevated on a pulpy, club-shaped, forked receptacle. Common receptacle globose, bristly.

t. B. *papyrifera*. Paper Mulberry. *Andr. Repof.* t. 488. (*Morus papyrifera*; Linn. *Sp. Pl.* 1399. *M. fativa, foliis urticæ mortuæ, cortice papyrifera*; Kämpf. *Am. Exot.*

471. t. 472.)—Native of Japan; probably also of China, and the South Sea islands. At least it is cultivated in all those countries. It appears from Miller to have been introduced into England before the year 1759, by the late duke of Northumberland. Dr. Broussonet saw the female tree in fruit at London, and possibly, as Poiret indicates, at Edinburgh, in 1782, and carried it with him to Paris, where the male only had previously been known, and consequently no suspicion could have arisen of its not being, as Linnæus supposed, a *Morus*, though dioecious. (See MORUS) It there bore fruit, which it continually does at Kew, and in other gardens, being quite hardy, and blossoming all summer long. This is a deciduous tree, of a moderate size, with the aspect of a mulberry, or rather of some arborefcient *Urticæ*. Branches alternate, round, downy, leafy at the extremities. Leaves alternate, stalked, ovate or somewhat heart-shaped, acute, serrated, deeply lobed and sinuated without any regularity, so that scarcely two can be found precisely alike; their upper side of a dull hoary green, very rough with minute cartilaginous tubercles; the under paler and downy, with numerous veins. Stipulas in pairs, ovate, pointed, downy. Flowers axillary, stalked; the male in very dense, cylindrical, blunt, drooping, greyish spikes, which have the aspect of catkins; female on a distinct tree, in equally dense, green, globular heads, about an inch in diameter. As the fruit advances, numerous scarlet, juicy, club-shaped, incurved bodies are protruded, in every direction, in whose summits the seed is lodged. These have a sweet flavour, but are not of consequence sufficient to render the fruit an object of cultivation, though it is not destitute of beauty.

The chief importance of this tree, consists in the uses made of its bark. The clothing of the inhabitants of the South Sea islands, in their primeval simplicity, was almost entirely prepared from it, several layers of the bark being laid over each other, and incorporated by beating, aided with some slight cement; and so elegantly coloured with the natural productions of the country, as to excite the admiration of our most intelligent voyagers. Kämpfer gives a particular account of the preparation of the Japanese paper from this bark. For this purpose the branches of the present year, after the leaves are fallen, in December, are chosen, and being cut into pieces about a yard long, are boiled, till the bark shrinks, and is easily separable from the wood, which is then thrown away. The bark being dried, is preserved till it is wanted. In order to make paper, it is soaked for three or four hours in water, after which the external skin, and the green internal coat, are scraped off. At the same time the stronger and firmer pieces are selected, the produce of the youngest shoots being of an inferior quality. If any very old portions present themselves, they are, on the other hand, rejected as too coarse. All knotty parts, and every thing which might impair the beauty of the paper, is also removed. The chosen bark is boiled in a lixivium, till its downy fibres can be separated by a touch of the finger. The pulp so produced is then agitated in water, till it resembles tufts of tow. If not sufficiently boiled, the paper will be coarse, though strong; if too much, it will be white indeed, but deficient in strength and solidity. Upon the various degrees and modes of washing the pulp, much also depends, as to the quality and beauty of the paper. Mucilage obtained from boiling rice, or from a root called *Oreni*, Kämpf. 474, one of the mallow tribe, is afterwards added to the pulp. The paper is finished much after the European mode, except that stalks of rushes are used instead of brass wires. See PAPER.

PAPYRUS. See CYPERUS.

PAPUASHE

PAQUASHE LAKE, in *Geography*, a lake of North America. N. lat. $50^{\circ} 48'$. W. long. $93^{\circ} 30'$.

PAQUILIGASTA, a town of South America, in the province of Tucuman; 40 miles S.S.W. of S. Miguel de Tucuman.

PAR, a term of nobility. See PEER.

PAR, CATHERINE, in *Biography*, sixth wife of Henry VIII. was daughter of sir Thomas Par, and received, according to the custom of the age, a learned education. She was known to be friendly to the reformation, and on that account bishop Gardiner, and others, whose zeal and bigotry were ever displayed against the reformers, endeavoured to effect her ruin, but by her prudence she preserved the king's favour till his death. In the year 1544 she was so much in the confidence of her royal spouse, that he made her regent while he went with a great army into France. After this she had a narrow escape from impeachment, of which Mr. Hume has given an interesting account. Immediately after the death of the monarch she married lord Seymour: the ceremony was, indeed, performed with so much haste, that the historian already quoted, says, "had she soon proved pregnant, it might have been doubtful to which husband the child belonged." She was extremely ill-treated by this second husband, which so much affected her, that she died in child-bed in the year after her marriage. Hume, vol. iv. Walpole's Royal and Noble Authors.

PAR of Exchange. This subject, which is so very familiar in the mouths of commercial men, yet so little understood, has been already incidentally noticed under the article EXCHANGE; but as what was said of it there refers more to its practical nature, than to the general principles on which it is founded, and by a knowledge of which alone it can be satisfactorily and fully ascertained, we shall enter more regularly and systematically into the discussion of it in this article. Most of the difficulties, and much of the obscurity, which encompass that part of the science of political economy, which relates to the commerce between nations, would be removed, if we were to consider this commerce as exactly the same in its nature, operations and effects, as the trade that is carried on between different parts of the same kingdom, or even between two individuals: by bringing the subject thus within a narrower compass, and placing it in a point of view more familiar and more within the reach of our observation and experience, we should be enabled to examine it more attentively, and to render ourselves acquainted with it more accurately, not only in its general principles, but in its minute and complicated details. These remarks will apply with peculiar force and propriety to the subject which we are about to discuss: in entering upon it, if we take our illustrations and examples, not from what passes in the commercial intercourse of two distinct nations, the denomination and value of whose currency differs, but from what occurs in the commercial transactions that are carried on between different parts of the same kingdom, we shall clear the way so completely, as to be enabled to proceed without impediment, confusion, or difficulty.

Let us take, as an example, the commercial intercourse between London and York; and suppose that in the former city, there are merchants who owe to their correspondents in London the sum of 2000*l.*, and merchants who have demands on their correspondents in London to the same amount. The obvious and natural mode of settling these claims, would be for the merchants who have money to pay in London, to pay the amount to the merchants who have money to receive in London: by this mode the York merchants, so far as they alone were concerned, would have their business settled; but there would yet remain to be arranged the pecu-

niary business of the London merchants, who either were indebted to the York merchants, or had money to receive from them: the mode of adjusting their business would be equally obvious and natural. The York merchant who had received the 2000*l.* from his brother merchant in the same city, as a settlement of the debt to that amount due to him in London, would in return give him an order for that sum on the London merchant his debtor; which order, transmitted to London, would serve to discharge the debt that the York merchant owed in the capital. It is easy to perceive what trouble and expence are saved by this arrangement: were it not adopted, the York merchant who owed 2000*l.* in London, must have been at the expence of transmitting this sum to London; and a similar expence must have been incurred by the other York merchant, or by his debtor in London, in transmitting the 2000*l.* from London to York. When the general plan of adjusting the debts in this mode was once arranged, there would be no difficulty in carrying it into execution, as the currency in York and London were exactly the same; but the case, in this respect, would be altered, if Dublin and London were concerned, instead of York and London. The currencies of England and Ireland differ in real value, though they are exactly the same in denomination. Let us now suppose that a merchant in London owes 2000*l.* in Dublin, and another merchant has 2000*l.* to receive in London. They would respectively save the freight and insurance of this sum, if in London they could adjust what they have respectively to receive or pay in Dublin: had the currencies of Ireland and England been exactly the same in real value, as they are in denominative value, there could not be the slightest difficulty in making this arrangement; but as there is a difference in the real value of the currencies of these two countries, this difference must be satisfactorily and exactly ascertained before any arrangement can take place. When this difference in the real value is determined, the par of exchange is said to be fixed; or in other words, the sums in the currencies of the two countries, which contain exactly the same quantity of the precious metals, are ascertained. In the case we are now supposing, *viz.* that between England and Ireland, the currency of the latter country is about eight *per cent.* worse than the currency of England; or in other words, the denominative value of the currency of the two countries being the same, there is about eight *per cent.* less of the precious metals in the coins of Ireland of the same denomination as those of England: a debt of 2000*l.* in Ireland, therefore, could be discharged for eight *per cent.* less of real value, than the same nominal debt could be discharged for in England: on this account the English merchant, who owes this sum in Ireland, and who wishes to discharge his debt by paying a sum of money to the other English merchant, who has owing to him 2000*l.* in Ireland, will only pay to the latter 2000*l.* minus eight *per cent.*; and the latter, if he receives this sum, will receive the full amount of his debt. It may perhaps be thought that the latter will refuse to accede to this mode of settling his debt: but a little reflection will convince us that in this, as in the former case between York and London, both merchants are accommodated in an equal degree by this arrangement; for let us see how they must proceed, if they did not accede to it. The merchant who owed the 2000*l.* in Ireland would be obliged to transmit there as much bullion as would be equal in value to 2000*l.* Irish currency; and the merchant, who had money to that amount to receive from Ireland, could get from that country only as much bullion, as that sum of Irish currency would purchase: hence, as the expence of freight, insurance, &c. would be the same in each case, it would evidently be for
their

PAR OF EXCHANGE.

their mutual advantage to settle their debts and payments in the manner which has been described.

The general rules, therefore, in fixing the par of exchange between any two countries, is by ascertaining the real value of the coin of these countries: if the same quantity of gold or silver is contained in two coins of two countries, these coins are equal in value to each other; if there is more gold or silver contained in the coin of one country, than in the coin compared with it of the other country, the values are not equal, but proportional: and these proportions can always be accurately expressed by the smaller coins, of which the larger ones that are compared are composed. Thus, let us suppose that the ruble of Russia, and the half-crown piece of Britain, contain exactly the same quantity of silver of the same fineness: then the par of exchange between Britain and Russia will be the ruble and the half crown piece; but as the intrinsic value of either or both of them may be changed, though their denominations remain the same, the par is more commonly expressed by the smaller coins which form them, as in the case of the half-crown, by the pence which compose it: and the par of exchange between England and Russia, is said to be, when the ruble of the latter country is at thirty pence. Again, let us suppose that the crown piece of Great Britain and the dollar of Spain are compared, and that it is found that the former contains more silver of the same purity than the latter: the difference can easily be ascertained, and as the crown piece is divided into, or composed of, smaller coins, this difference, when ascertained, can as easily be expressed. The crown piece is equal to sixty pence: the dollar, we shall suppose, contains one-tenth less silver than the crown piece; if the par between Spain and England, therefore, is measured by a reference to these two coins, it will be expressed, by stating it at four shillings and sixpence British for the Spanish dollar. The advantage, and even necessity, of supposing the coins thus compared divided into their component parts, will be further illustrated when we come to consider the circumstances that affect the real or nominal par of exchange.

It may seem superfluous to enquire upon what principle equal quantities of the precious metals are supposed to be of equal value in different countries; yet this requires investigation. Let us suppose that a merchant of London, who owes 2000*l.* in Dublin, is not able to obtain a bill on that city, and has no other mode of discharging his debt but by transmitting the money. Let us farther suppose, that for this purpose he cannot transmit English money to Ireland: how is he to proceed? The only mode he can adopt, is to purchase in London as much bullion as will sell for, or may be coined into, 2000*l.* in Dublin; he cannot discharge his debt by the mere bullion he transmits; could he do this in all cases, the principle, that equal weights of bullion were always of equal value in all countries, would be without exception, and would be a fundamental principle, beyond which we could not proceed in illustrating the doctrine of the par of exchange. But if cases may occur, in which the bullion and the mint value of the precious metals differ, then, in these cases, we must look beyond this principle, for a principle more steady on which to ground the doctrine of the par of exchange. Let us suppose that the merchant who owes 2000*l.* in Dublin, being perfectly well acquainted with the quantity of the precious metals contained in this sum of Irish currency, purchases that quantity in London, and transmits it to Dublin: in the mean time, a difference has taken place in this city, between the bullion and the mint value of the precious metals; the bullion value has fallen, so that the quantity of bullion trans-

mitted will not sell for 2000*l.* Irish currency. In this case we perceive, that by fixing the par merely by a reference to the quantity of the precious metals in the coins of any two countries, we should fix it inaccurately; it may, indeed, be alleged, that the bullion and mint value of the metals can never differ much, nor for a long continuance; but as they may, and do differ, though to ever so trifling an amount, and for ever so short a time, we must correct the principle on which the par of exchange is fixed: thus corrected, it will stand thus;—the par of exchange must be estimated, not by a comparison between the quantities of bullion contained in the coins of any two countries, but by a comparison between the quantities of bullion which these coins will purchase: this is the accurate principle; but as in most cases the bullion and mint value are equal; and as, where an inequality does exist, it is very trifling, and continues but for a very short period, the usual manner of computing the par of exchange is, in most instances, sufficiently just and accurate.

It must, however, be observed, that the comparison of the coins of different countries has not been made with all that skill and attention which ought to have been employed upon it: indeed the par seems to have been fixed at a time when the art of assaying metals and determining their positive and relative purity was comparatively but little known.

But the loose and inaccurate mode in which the par of exchange has been fixed, as well as the unfoundness of the principle, which would infer an equality of value in the coins of two countries from the circumstance of their containing the same quantity of the precious metals, will be further confirmed and illustrated by a reference to the coinage of France before the revolution. At that time a duty, or seignorage of eight *per cent.* was paid on all bullion brought to the mint for the purpose of being coined. Let us suppose that a Louis d'or, and an English guinea, contained each the same quantity of gold, of the same purity, and that that quantity was a quarter of an ounce, according to the principle that we are examining, the exchange between England and France would be said to be at par, when a guinea in London purchased a bill on Paris for one Louis d'or, since, in this case, a quarter of an ounce of gold in London purchased neither more nor less than a quarter of an ounce of gold in Paris. But a little reflection will serve to convince us, that when a guinea in London purchased a bill for a Louis in Paris, the exchange, instead of being at par, was in fact favourable to England eight *per cent.*: for, let us suppose that the merchant who had to pay the Louis in Paris could not obtain a bill in London, but was obliged to send bullion to Paris to discharge his debt; how much bullion must he send for that purpose? if a quarter of an ounce of gold would serve to discharge his debt; then, on the supposition that he procured a bill, and paid for it only a guinea, or a quarter of an ounce of gold, the exchange would be at par; but he would find, if he sent only a quarter of an ounce of gold to Paris, that it would not discharge his debt of a Louis. When his gold is brought to Paris, it must either be coined, or sold, before the debt can be discharged: if it is taken to the mint, eight *per cent.* will be kept to pay the expences of coinage; consequently, when converted into money, it will not discharge his debt by eight *per cent.*: if the gold is sold, it will not procure a Louis, or a coin of a quarter of an ounce of the same metal, by eight *per cent.*; for no person will give the same weight of coined gold for uncoined gold, when the coinage cost eight *per cent.* The merchant in London, therefore, who has a Louis to pay in Paris, must pay for a bill to that amount the quantity of bullion contained in a Louis, and

PAR OF EXCHANGE.

eight *per cent.* more; or, in other words, he must pay a guinea, and eight *per cent.* more; and by purchasing a bill on Paris at this rate, he loses nothing, nor does the person who sells the bill gain any thing by the transaction; for let us suppose that he can find no merchant to take his bill, but is obliged to get the money due to him in Paris, or in the best manner he is able: with the Louis due to him there, he purchases bullion; and as coined gold is eight *per cent.* more valuable in Paris than uncoined, he gets for his Louis, (all along supposed to weigh an ounce,) an ounce and one-eighth of uncoined gold, which, when brought to England and taken to the mint, will procure him a guinea, and one-eighth *per cent.* On the suppositions, therefore, which we have proceeded upon, that a guinea and a Louis contained the same quantity of gold, and that the duty on coinage in France was eight *per cent.*, the par of exchange between England and France would not be a guinea for a Louis, but a guinea and one-eighth *per cent.* for a Louis; or, in other words, a bill for an ounce of coined gold in Paris, would be worth in London an ounce of gold, and one-eighth *per cent.* Hence it is obvious, that the par of exchange ought not to be fixed by a reference merely to the quantity of the precious metals contained in the coins of two countries; and that the exchange between any two countries is actually at par, when no more is paid for a bill on one of these countries, than would be necessary to procure the bullion that could be sold for, or coined into the sum expressed in the bill, though the sum paid, and the bullion it could procure, were really greater than the sum expressed in the bill.

There is yet another case, which will require to be considered, before we proceed to state and examine those circumstances which affect the nominal and real par of exchange. The currency of almost all countries consists of two different kinds of metals, gold and silver, (for copper, though forming part of the currency, need not enter into our investigation.) The gold and silver currency of all countries is fixed by the proportionate value of these two metals: let us suppose the proportionate value of gold and silver to be as 1 to 15, *i. e.* that one ounce of gold is worth fifteen ounces of silver. There may be some little difference in this proportionate value in different countries; but the great bullion market of the world keeps it nearly the same, and generally pretty steady. What would be the effect on the par of exchange, on the supposition, that in one of two countries which trade with each other, the proportionate value changed; let us suppose, for instance, that in England the proportionate value continued as stated above, 1 to 15, while in France silver became so much more abundant, that the proportionate value was 1 to 16. Would the par of exchange be affected by this circumstance? and if it were affected, in what mode, and to what extent would it be affected? In the case supposed, the price of silver would fall in France while it continued steady in England; or, in other words, if we suppose no duty on coinage to exist in either of these countries, the bullion price of silver in France would fall below its mint price, and silver bullion would exchange for less gold bullion than it did before; but the proportionate value between coined gold and silver would remain the same. It might, at first sight, appear, that a merchant in London, who had a debt to discharge in Paris, would be benefited by this circumstance; as, it may be said, he might transmit gold bullion, which, in Paris, would command a larger quantity of silver than formerly: undoubtedly this would be the case, for every ounce of gold transmitted to Paris, he would get sixteen ounces of silver instead of fifteen, as formerly; and if his object were to bring

this silver to England, and there exchange it for gold, he would profit by the alteration in the proportionate value of the two metals, since in England he would obtain an ounce of gold for fifteen ounces of silver, and thus have a profit of one ounce of silver in the transaction; but in the case here supposed, that he has a debt to discharge in Paris, he would not be benefited by the alteration in the proportionate value of the two metals, unless he took the sixteen ounces of silver to the mint, for if he sold the silver bullion, he would get as much less for it as its value had fallen in proportion to gold: if, however, he took sixteen ounces, instead of fifteen, to the mint, it is obvious that he would get more silver coin, and consequently that his ounce of gold, by this variation in the proportionate value of the two metals, would enable him to discharge his debt on easier terms, provided it could be discharged in silver. But if the amount of the debt were very great, payment of it in silver could not legally be enforced. This circumstance, joined to the consideration that the proportionate value of the gold and silver currency of any country must always be kept as nearly as possible the same as the proportionate value of gold and silver bullion in that country, will always prevent the par of exchange being much, or for any length of time, affected by a change in the relative value of gold and silver in any two countries. On the contrary supposition, that gold falls and silver rises, so that, for instance, one ounce of the former metal is worth only fourteen ounces of the latter, it is obvious that the comparatively greater expence of the freight of silver will prevent a merchant from taking advantage of this circumstance, and consequently will keep it from having any material influence on the exchange.

In treating on this subject, it is of the utmost importance to distinguish accurately and clearly between the nominal and the real par of exchange: they are often confounded both in theoretical and practical writings. The cause of this confusion will be best explained by a consideration of the circumstances that affect the nominal par of exchange as separate and distinct from those circumstances which affect the real par of exchange. The most obvious circumstance that has influence on the nominal par of exchange, is the depreciation of the currency of a country, or a diminution of its real and intrinsic value; as the denomination of the currency continues the same, though its real and intrinsic value is lessened, the par of exchange will also continue the same. Thus, let us suppose, that when the par between Russia and England was fixed, the ruble of the former country, and the half-crown of the latter country, each contained exactly the same quantity of silver, of the same purity, and that that quantity was half an ounce. When, therefore, a ruble, exchanged for half a crown, the exchange was at par: let us now suppose, that the ruble of Russia, though still retaining that denomination, no longer contains half an ounce of silver, but only a quarter of an ounce of that metal. In this case it will not exchange for half a crown, or thirty pence, but only for half that sum, or fifteen pence; but the par between the two countries being still considered as fixed at thirty pence the ruble, the rate of exchange will appear to be very much against Russia, when the ruble is quoted as only worth fifteen pence, whereas, in fact, when the ruble will purchase a bill on England for fifteen pence, it purchases its full value: all this is very clear and obvious; but the mode in which this difference in the power of the ruble over British currency takes place, requires some illustration; and this illustration will confirm the position we laid down, that in considering the par of exchange between the two countries, we ought to look beyond the quantity of the precious metals contained in the coins of these countries

PAR OF EXCHANGE.

to the power of the metals over these coins, when sold for them. Instead of supposing that the ruble was all at once lowered so much, as to contain only a quarter of an ounce of silver, instead of half an ounce, let us suppose that the diminution in the quantity of silver contained in this coin was very trifling, and did not produce a correspondent rise in the nominal price of silver or bullion; or, in other words, that a ruble, though less by one, two, or three *per cent.* than half an ounce of silver, still would purchase half an ounce of silver bullion. In this case, would the nominal par of exchange between England and Russia be changed? We apprehend not; and for this reason, if a merchant in London, who wished to purchase a bill on Petersburg, refused to give at the rate of half a crown a ruble, on the ground that the ruble no longer contained the same quantity of silver as half a crown, that is, half an ounce, and not being able to obtain the bill on lower terms, determined to transmit bullion, he would soon be convinced, that to discharge his debt, he must pay as much as if he had bought the bill at the rate of half a crown the ruble; for, on the supposition made, that the nominal price of silver in Petersburg had not risen in proportion to the debasement of the ruble, but that this coin, though containing one, two, or three *per cent.* less silver, still purchased as much silver bullion, he would be obliged to transmit as many half ounces of silver as he had rubles to pay, and consequently it would have been more advantageous for him to have purchased the bill on Petersburg, at the rate of half a crown the ruble.

Thus, we perceive, that unless the power of the coin of any country over bullion is diminished, the mere circumstance of the diminution of the intrinsic value of that coin will not affect its exchangeable value, with the unaltered coin of another country, for so long as it can purchase the same quantity of bullion as formerly, it will exchange on equal terms with the same foreign coin as formerly. It may, indeed, be objected, that the coined precious metals will always purchase, neither more nor less, than the same quantity of the uncoined metal, which they respectively contain; and consequently, if they contain less than formerly, they will purchase less than formerly: but this, though undoubtedly true in general, is not true universally. Where confidence and credit are great in any country, and where the coin has its intrinsic value slowly and gradually diminished, merely by the circumstance of its being worn, the nominal value of bullion will not always correspond with the actual depreciation in the value of the coin. Indeed, setting aside the consideration of confidence and credit, there is a great difference between coin worn by use, and coin reduced in the same degree, when it first comes from the mint: in the latter case, no person in possession of bullion will sell it for the same number of coined pieces of gold or silver, as he did before their debasement, because, by taking his bullion to the mint, he can get a greater number of coined pieces out of it; he will, therefore, no longer sell his silver at five shillings *per ounce*, if these five shillings contain only half an ounce of silver, because at the mint he can get his ounce of silver coined into ten shillings; this price, therefore, he will ask for his silver *per ounce*; and, as has been often remarked, if the price of bullion rises in nominal value, the nominal rate of exchange will rise in the same proportion; so that a foreign coin, containing an ounce of silver, will exchange for ten shillings, instead of five, and thus the exchange will appear to be unfavourable, when, in fact, it is not so, no more being given for the foreign coin than would be necessary to purchase the silver that would sell for it. But it is different, when the coin of a country has undergone a slow and gradual diminution by wear;

in this case, if the bullion merchant refuses to sell his bullion at the old price, what alternative has he: he refuses, for instance, to take five worn shillings for an ounce of silver: but if he carries his ounce of silver to the mint, he gets from it, when coined, only five shillings, which, in the purchase of commodities, are of no more value than the five worn shillings that he refused for his ounce of bullion. In this case, the rate of exchange cannot be even nominally altered; since the coin, though worn, will still sell for as much bullion as formerly, and consequently a debt to be paid in that coin will require as much bullion to discharge it as formerly.

Hitherto we have confined our remarks and illustrations entirely to those cases, in which the metallic currency of a country is supposed to be debased or worn; we shall now examine what effect on the par of exchange will be produced by a paper currency. So long as this paper currency is not depreciated, the nominal par of exchange will be precisely the same as the real one: this position will easily be made out. Let us suppose, as formerly, that the ruble of Russia is the par of the half-crown of England; and that in the former country a paper currency is issued, and that paper rubles circulate as well as metallic ones: so long as these paper rubles are equivalent to the metallic ones, so long will the real and nominal par of exchange be precisely the same. For, as we have already explained, the metallic ruble of Russia is deemed the par of the half crown of England, not (strictly speaking) because each coin contains the same quantity of silver of the same standard, but because the one coin will purchase as much silver, as if sold, or coined, will be equivalent to the other coin; while, therefore, the paper ruble will exchange for the silver ruble, it must have the same command over silver bullion as the silver ruble, and consequently must indirectly have the same command over the half-crown of England. Let us now suppose that the paper currency of Russia is depreciated, from whatever cause: and that, in consequence of this depreciation, a paper ruble will no longer exchange for a silver ruble, nor purchase the quantity of silver bullion contained in a silver ruble. In this case the nominal par of exchange will no longer coincide with the real par of exchange, but will rise above it in the same ratio precisely as the paper ruble has fallen in value below the metallic ruble: if it require a paper ruble, and one-tenth of a ruble, to purchase the silver contained in a silver ruble, or if a silver ruble, by the depreciation of paper currency, become equivalent to one paper ruble, and one-tenth of a paper ruble, then the real par between England and Russia will be a half-crown of the former country for a paper ruble and one-tenth of a paper ruble of the latter country. This will be the real par of exchange; but as the par is still supposed to continue as it was, that is, a half-crown of England for a ruble of Russia, the exchange will appear to be conformable to Russia, when in fact it is at par.

From these remarks and illustrations, it is sufficiently evident, that the real par of exchange between two countries must be ascertained by the following process: the object of the merchant who has a debt to discharge in a foreign country, is to pay no more, in his own country, for the means of discharging that debt, than it would cost him to effect it in the foreign country. If he were obliged to pay the debt in the foreign country, he must of course procure the coin of that country; and, therefore, for the purpose of discharging it in his own country, he must consent to give as much as would be necessary to procure the sum which he owes. If, in the foreign country, the precious metals in bullion and in coin are exactly of the same value, he could discharge his debt there by transmitting the precise quantity of bullion contained in the sum he owed; but if, as was the case in

PAR OF EXCHANGE.

France before the revolution, the precious metals in bullion were not equivalent to the precious metals when coined, he would be obliged to transmit as much more bullion as was necessary to make them equivalent, and consequently, if in his own country he paid no more than the price of this bullion for a bill to discharge his foreign debt, he, in fact, bought his bill at par. The same general illustration might be pursued with respect to a bill bought with a depreciated paper currency; if no more were given for the bill, than would have been sufficient to have purchased the bullion necessary to discharge the debt; the bill, in this case, was bought at par, though nominally much more was given for it.

There is only one other case, in which the nominal and real rate of exchange can differ, and this case is thus explained by Smith in his *Wealth of Nations*: we shall give his explanation, and then offer some remarks on it, as at first sight the fact which it unfolds may seem to militate against the doctrine we have laid down on this subject.

“In some places, as at Amsterdam, Hamburg, Venice, &c. foreign bills of exchange are paid in what they call bank money; while in others, as at London, Lisbon, Antwerp, Leghorn, &c. they are paid in the common currency of the country. What is called bank money is always of more value than the same nominal sum of common currency. A thousand guilders, of the bank of Amsterdam, for example, are of more value, than a thousand guilders of the bank of Amsterdam currency. The difference between them is called the *agio* of the bank, which at Amsterdam is generally about five *per cent.* Supposing the current money of the two countries equally near to the standard of their respective mints, and that the one pays foreign bills in this common currency, while the other pays them in bank money, it is evident that the computed exchange may be in favour of that which pays in bank money, though the real exchange should be in favour of that which pays in current money; for the same reason that the computed exchange may be in favour of that which pays in better money, or in money nearer to its own standard, though the real exchange should be in favour of that which pays in worse. The computed exchange before the late reformation of the gold coin, was generally against London with Amsterdam, Hamburg, Venice, and, I believe, with all other places which pay in what is called bank money. It will by no means follow, however, that the real exchange was against it. Since the reformation of the gold coin, it has been in favour of London, even with those places. The computed exchange has generally been in favour of London, with Lisbon, Antwerp, Leghorn, and if you except France, I believe with most other parts of Europe that pay in common currency, and it is not improbable that the real exchange was so too.”

The cause of this difference between bank money and the common currency of Amsterdam, &c. is explained by Smith himself, in his digression concerning banks of deposit. In Amsterdam, &c. the coin in circulation consisted of the currency of different countries; and consequently differed very much in its intrinsic value, and was also liable to great variations of value. Hence, even if there had been no banks of deposit, these various coins must have passed in exchange for bullion, not according to their denominative, but according to their real value, and, as we have already explained, the rate of exchange is fixed by the command which the respective currencies of two countries, that trade with each other, possess over bullion. This difference between the bullion and the mint value of the various coins circulated in Amsterdam, would be confirmed by the circumstance, that the bank of deposit, when a sum of money in these coins was paid into it, gave credit only for the actual quantity of

bullion which they contained. A merchant in London, therefore, who gave five *per cent.* above the nominal par for a bill on Amsterdam, to be paid in bank money, gave no more than the real value of the bullion which he was to receive, and consequently, in fact, bought his bill at par.

Having thus considered, at sufficient length, the different circumstances which affect the nominal rate of exchange, we shall now advert to those circumstances which have a tendency to raise or lower the rate of exchange, actually, above or below par.

Let us suppose that the merchants in London have bought goods in Paris to the amount of 2000 Louis d'ors; while other merchants in London have sold goods in Paris to the same amount: the latter draw bills for that sum, and the former become purchasers of these bills. At what rate will these bills be purchased? Undoubtedly at the real par of exchange, whatever that may be, since the supply and demand are exactly equal. If, therefore, the par of exchange be a guinea for a Louis, the merchants who have drawn bills upon Paris to the amount of 2000 Louis, will receive for them 2000 guineas; and thus each party will be accommodated, and save the expence of freight and insurance in transmitting or receiving what they owe, or what is owing to them. Let us now suppose that the bills in London on Paris are still for 2000 Louis, but that, owing to the London merchants having purchased fewer goods in Paris, there is a demand for bills on Paris only to the amount of 1500 Louis: in this case it is evident that the price of bills on Paris will fall, as the proportion between the demand and the supply is altered; the supply is the same, but the demand is become less; hence a bill on Paris for a certain number of Louis, will no longer command in the London market the same number of guineas; that is, it will no longer be sold at par; but at two, three, or five *per cent.* below par. In this case the exchange is said to be unfavourable to France, because French money in the London market, or what is the same thing, a bill for French money, will no longer bring its real and intrinsic value. On the other hand, let us suppose the amount of the bills in London on Paris to be still 2000 Louis, but the demand for these bills increased from 2000 to 2500 Louis; on this supposition it is equally plain that the exchange between London and Paris will rise above par; or, in other words, that for a bill for a certain number of Louis, more than the same number of guineas will be paid. In this case the exchange is said to be favourable to Paris, and unfavourable to London, because for French money, or a bill for French money in London, more than its equivalent in British money is paid.

There are several points to be investigated, connected with a *real* variation in the rate of exchange between two countries; in the first place, to what amount can the exchange become unfavourable to any country; in the second place, what effects does a favourable or unfavourable exchange produce on the commercial transactions of two countries; thirdly, by what process is the exchange, when it varies from the real par, brought back to that par; and, lastly, can the exchange between any given country, and all the other countries with which it trades, be, on an average, for any length of time, either above or below the real par.

In the first place, to what amount can the exchange become really unfavourable to any country? Let us suppose that a merchant in London wishes to purchase a bill on Paris for 500 Louis, but that owing to the small supply of such bills, or the great demand for them, he finds he must pay for it ten *per cent.* above par. He will, before he agrees to these terms, enquire whether he cannot discharge his debt in Paris at a cheaper rate; the most obvious and simple mode is by the purchase and transmission of bullion; and if he finds that

PAR OF EXCHANGE.

he can purchase bullion at the mint price, and can send it over to Paris at a cheaper rate than ten *per cent.*, he will naturally prefer this mode of settling his debt, to giving such a high premium for a bill on Paris. In fact, therefore, the exchange can never become unfavourable to any country, to a greater amount *per cent.* than will pay for the transmission of bullion: it may, indeed, be alleged that where the price of bullion has risen, the exchange may become unfavourable to the amount of that rise, added to the amount of the charges of transmission; but from what has been already said respecting the nominal rate of exchange, it will be sufficiently apparent, that the rate *per cent.* above the computed par, which is paid for a bill, must not be considered as indicating or measuring a really unfavourable exchange, but that this must be considered as indicated and measured solely by the amount of the sum paid for the bill above the price of the bullion which it would purchase. It is not easy to fix the rate *per cent.* which the transmission of bullion to any particular country would cost; it must vary from the different causes. In the circumstances of Europe, since the French revolutionary wars, the difficulty and risk of transmitting bullion to any part of the continent, subject or exposed to the French arms, must have been greatly increased; and consequently, from this cause, independently of the operation of other causes affecting the nominal rate of exchange, the real rate of exchange between Great Britain and the continent may have become unfavourable to a greater degree than it would otherwise have been.

In the second place, what effects does a favourable or unfavourable exchange produce on the commercial transactions of two countries trading with each other? It is abundantly clear and evident, that if the exchange between England and France is unfavourable to the former country, she must pay a higher price for all the commodities she imports from France. The British merchant indeed purchases them in France at the same rate as formerly: he gives, we will suppose, ten Louis for a pipe of wine; but let us consider what in fact he will pay for this wine, when the exchange is at par, and when it is unfavourable to England. In the former case, he will pay for a bill for ten Louis, exactly ten guineas (on the supposition that a guinea and a Louis form the *real par*), while, in the latter case, he must pay for a bill for ten Louis, ten guineas, and one, two, or three *per cent.* more, according as the exchange is more or less unfavourable to England; consequently, though he purchases the wine at the same rate in Paris, it costs him more in London, French money, or a bill for French money, being there worth more than its real and intrinsic value; or, in other words, the demand for these bills being greater, or the supply of them less, than formerly.—Let us now reverse the case, and suppose that the exchange is favourable to England; that in the London market there are more bills than formerly on Paris, while the demand for them is the same; under these circumstances, bills on Paris may be purchased under par; and consequently the price of wine still continuing the same in that city, the English merchant, by purchasing bills under par, will in reality purchase it at a cheaper rate. The general conclusion is, that when the exchange between London and Paris is favourable to the former city, *i. e.* when a certain sum of English money is worth more than its *par*, in the purchase of bills on Paris, then, in this case, French goods may be brought into England at a cheaper rate; whereas, if bills in London on Paris are above par, or in other words, if the exchange is unfavourable to England, so that for a bill for a certain sum on Paris, more than its *par* in English money is given, then, in this case, French goods will be bought at a dearer rate.

We are now, in the third place, to examine by what process the exchange, when it varies from the real par, is brought back to it: what we have unfolded and illustrated under the second head, will, in some degree, explain this process. Let us suppose that the exchange between London and Paris is unfavourable to the former place one, two, or three *per cent.*, or that one, two, or three *per cent.* must be given in London, as a premium for a bill on Paris. It is abundantly evident that in this case, the supply of bills is not equal to the demand; this is indicated by the rise in the price of them above par; but it is well known, what takes place when the demand for any commodity, becoming greater than the supply of it, raises its price: capital and industry are withdrawn from other sources of employment, and directed to the commodity, of which there is an inadequate supply. The same will take place with respect to bills of exchange; as it has become a profitable concern to deal in them, more of them will be brought into the market, but it is evident that no man can draw a bill of exchange, unless he has property or credit in the country on which the bill is drawn. Bullion, therefore, or goods, will be sent into France from England, when bills on France bear a premium in England; and though they sell in the former country for no more than they would have done when the exchange was at par, yet as a bill for the sum at which they are sold bears a premium, that premium secures a profit to the exporter of the bullion or merchandise. By this exportation more bills on France are presented in the London market, and the price of them is reduced, till it reaches par. On the other hand, let us suppose that there are more bills on France in the London market than there is a demand for; or, in other words, that the exchange is favourable to London; in this case, by what process will the exchange be brought to par? The quick-sighted interest of commercial men will soon effect this: in the first place, the English merchant, finding that his bills are at a discount, will lessen his exports to France; and in the second place, as has been already stated and explained, the low price of bills on France will act as a motive to the importation of more French commodities, which, of course, will create a demand for more bills, and thus bring the exchange back to par.

Hitherto we have considered the unfavourable exchange, or (to speak more correctly) the exchange, when either above or below par, as brought back to par, solely by the transactions of merchants, and by the actual transmission of commodities; but perhaps it is more frequently brought back to par by other means. There are, in all commercial countries, merchants who deal principally in bullion and bills of exchange: a correspondence is kept up among these merchants; and they accommodate and benefit each other, according as the rate of exchange rises or falls in their respective countries. Thus, let us suppose that two merchants, one in Paris and the other in London, have entered into a correspondence of this nature; and that in London, bills on Paris bear a large premium. In this case, the London merchant draws bills on his Paris correspondent, which are duly honoured; and the latter divides the premium or profit on them with the former. If, on the contrary, bills in Paris on London bear a premium, the Paris merchant draws on his London correspondent, who in his turn duly honours them, and divides the profit. Thus it is evident, that an unfavourable exchange may be brought back to par, without the transmission of bullion or goods, and solely, as we observed, by credit: but it is also evident, that if the exchange continues unfavourable to England, for example,

for

for a considerable length of time, the kind of transaction we have been describing cannot go on, without the transmission of bullion or commodities.

There is another mode by which, when the exchange deviates from par, it is brought back to it. Let us suppose that bills in London on Paris bear a high premium, and that bills in America on Paris are at a considerable discount. In this case, bills, like all other commodities under similar circumstances, will leave the place where they are cheap, and seek the place where they are dear; or, in other words, the American merchant will bring his bill on Paris to the London market. He will be the more induced to do this, if, in addition to the circumstances that bills on Paris are cheap in America and dear in London, it should happen that bills in America on London are dear; and this was exactly the case during the earlier years of the second French revolutionary war. England imported more from France than she exported to it; America exported more to France than she imported from it, and imported more from England than she exported to it: the consequence was, that in London bills on Paris bore a premium, while bills on Paris in America were at a discount, and bills in America on London at a premium. Under these circumstances, let us suppose an American merchant who had imported goods from England: he wishes to purchase a bill in America on England, to pay for these goods; but he finds that for it he must pay a premium, while, at the same time, bills in America on Paris are at a discount: he therefore purchases a bill on Paris, instead of a bill on England; and this bill, which he purchases at a discount in America, he sells at a premium in London; thus discharging his English debt for less than its real value; whereas, if he had discharged it by purchasing in America a bill on England, he must have discharged it for more than its real value. Let us now consider the effect of this transaction on the rate of exchange in America and England. In the former country, the exchange with England was unfavourable, or, in other words, there was a greater demand for bills than could be supplied; consequently they were at a premium, or the exchange was below par: but the American merchant, by purchasing a bill on Paris, instead of a bill on England, lessens the demand, and thus brings the exchange nearer to par. By the same operation, he increases the demand for bills on Paris, which before were in too large a supply, and consequently at a discount; or, in other words, the exchange between America and Paris was above par, or favourable to the former. Thus we perceive that in America, by a very simple process, a process to which interest will always be a sufficient motive and guide, the rate of exchange with two distinct countries is brought back to par. Let us now follow the effects of the same transaction in England: the American merchant pays his English debts with a bill on Paris, and consequently, by increasing the supply of these bills, reduces the premium on them; or, in other words, reduces the exchange between England and France nearer to par.

The concluding inquiry is, whether the exchange between any given country, and all the other countries with which it trades, can, on an average, for any length of time, be above or below the real par? This question is one of more importance than difficulty; and we shall probably arrive at its true and satisfactory solution, by the following considerations.

In the first place, it has been abundantly shewn, that the interest of the merchant prompts him to take advantage, either of a favourable or unfavourable rate of exchange, in such a manner as most certainly, and in no long space of

time, to reduce it to par. If it were, therefore, even possible for any nation to have an unfavourable rate of exchange with all the other nations with which it trades, this would soon be rectified by the commercial transactions of its merchants.

But in the second place, such an event could not take place at all, even for the shortest space of time: for let us consider what it implies, and would produce. It implies that the nation, supposed to be so circumstanced, purchases more commodities than it sells. Let us even for a moment suppose this to be the case: the overplus of its purchases must be paid for; but by the hypothesis, only its bullion and coin can be employed for that purpose; and if they are exported, commodities must become cheap; if commodities become cheap, buyers will flock into it; or, in other words, its exports will increase, and consequently the rate of exchange will be restored to par, or perhaps raised above it.

In the whole of this discussion, and in most discussions on the par of exchange, it is supposed to be affected only when the trade between any two countries is not balanced or equal; that is to say, when one country imports more commodities from the other country than it exports to it. But there are several other circumstances which affect the par of exchange, though it was not necessary, in discussion, and explaining the general principles of this subject, to enter upon them: the most material and common of them may, however, be noticed.

In the first place, besides the merchants who require bills on any particular country, to pay for the commodities they may have purchased there, government has frequently occasion for these bills, for the purposes of subsidy, civil and military expenditure, &c. The history of the present and of the last war affords many striking instances of this fact, and of the consequences produced on the rate of exchange, by the increased demand for foreign bills on the part of government.

In the second place, all persons who are leaving the country to settle abroad, or who have money to transmit abroad, though not for mercantile purposes, naturally prefer purchasing bills of exchange; and consequently, from this cause, the rate of exchange is affected.

Lastly, another source of demand for bills of exchange arises in England from the dividends on the stock held by foreigners, as these dividends are usually transmitted by means of bills of exchange.

When, therefore, the rate of exchange is unfavourable to a country, it by no means follows that that country is importing goods to a greater amount than it exports. If bills of exchange were sought after, and employed solely to pay for goods imported, this would be a legitimate inference; but as they are employed for other purposes, such a conclusion is erroneous.

We have thus endeavoured to illustrate the doctrine of commercial exchanges, on the general principles of political economy; and if, in some parts of this article, we may seem to have been too minute, and to have descended to details too familiar, our apology must be derived from the anxiety we felt not to leave obscure any part of the subject, and from our conviction that political economy, more than any other science, requires ample and familiar illustration.

PAR, in *Geography*, a river of Bavaria, which runs into the Danube, four miles below Ingoldstadt.

PAR *Vagum*, in *Anatomy*, the eighth pair of nerves. See *NERVOUS System*.

PARA, in *Commerce*, a small Turkey coin, 40 of which are equal to a piastre, and contains three aspers.

PARA,

PARA, *Grand Para*, in *Geography*, the most northern of the colonies or governments of Brasil, in South America. This government comprehends that part of Guiana which belongs to the Portuguese, on the north side of the river Amazons, extending from the union of the river Madeira to the Atlantic, about 600 miles from east to west, and 200 from north to south. It produces abundance of cotton, sugar, vanilla, chocolate, coffee: a fleet laden with these articles has usually sailed every year for Lisbon. The climate is extremely hot; and the woods abound with valuable timber of great solidity and brilliant colours, and some trees that yield odorous balsams. (See **BALSAM**.) The capital Para, situated at the mouth of the great river Tocantin, which receives that called dos Bocas, into which a natural canal from the Maranon (called Tagipuru) has been opened by the violent tides. This is a rich and handsome town, with two parish churches, and a college. Besides a citadel, it has a fortress, with a strong train of artillery, and a garrison of four companies. S. lat. $1^{\circ} 45'$. W. long. 50° .

PARA, a large river of Brasil, formed by the union of the Tocantin and the Guanapa, which runs about 120 miles in a north-easterly direction, separating the island of Marajo from the continent, and discharging itself into the Atlantic, about 20 miles S. of the Line.—Also, a river of Brasil, which rises about 150 miles W. of Villarica, and runs into the S. Francisco, S. lat. $16^{\circ} 50'$.—Also, a town of Turkish Armenia; 90 miles N.N.E. of Cars.

PARA Hotun, a town of Chinese Tartary, on the river Kerlon. N. lat. $48^{\circ} 6'$. E. long. $113^{\circ} 14'$.

PARA, in *Mythology*, is the name of the Hindoo goddess Parvati, in her character of *Prakriti*; which see. It means first, or greatest.

PARABITTA, in *Geography*, a town of Naples, in the province of Otranto; 10 miles N.W. of Alessano.

PARABLE, παραβολη, formed from παραβαλλειν, to oppose, or compare, a fable, or allegorical instruction, founded on something real, or apparent, in nature, or history; from which a moral is drawn, by comparing it with some other thing, wherein the people are more immediately concerned. (See **ALEGORY**.) Or, it is that figure of sentences, which illustrates a thing by comparing it with some other, to which it bears a resemblance.

Such are those parables of the ten virgins, of Dives and Lazarus, of the prodigal son, &c. in the New Testament.

Aristotle defines parable, a similitude drawn from form to form. Cicero calls it a collation, others a simile. F. de Colonia calls it a rational fable.

The Hebrews call it חש"ב, from a word which signifies either to predominate, or to assimilate: the Proverbs of Solomon are by them also called חש"ב, parables, or proverbs.

Glossius defines parable a simile, by which a fictitious thing is related as real, and compared with some spiritual thing, or accommodated to signify it.

Some make parable differ from fable; Grotius and others use the two terms promiscuously. Kircher derives the use of parables from the Egyptians.

Parable, according to the eminently learned bishop Lowth, (Lectures on the Sacred Poetry of the Hebrews,) is that kind of allegory which consists of a continued narration of a fictitious event, applied by way of simile to the illustration of some important truth. The Greeks call these allegories αἰοι (or apologues,) the Latins fabulæ, or fables; and the writings of the Phrygian sage, or those composed in imitation of him, have acquired the greatest celebrity.

Nor has our Saviour himself disdained to adopt the same method of instruction, of whose parables it is doubtful, whether they excel most in wisdom and utility, or in sweetness, elegance, and perspicuity. As the appellation of parable has been applied to his discourses of this kind, the term is now restricted from its former extensive signification to a more confined sense. This species of composition occurs very frequently in the prophetic poetry, and particularly in that of Ezekiel. If to us they should sometimes appear obscure, we must remember, that in those early times, when the prophetic writings were indited, it was universally the mode throughout all the eastern nations, to convey sacred truths under mylterious figures and representations. In order to our forming a more certain judgment upon this subject, Dr. Lowth has briefly explained some of the primary qualities of the poetic parables; so that, by considering the general nature of them, we may decide more accurately on the merits of particular examples.

It is the first excellence of a parable to turn upon an image well known and applicable to the subject, the meaning of which is clear and definite; for this circumstance will give it perspicuity, which is essential to every species of allegory. If the parables of the sacred prophets are examined by this rule, they will not be found deficient. They are in general founded upon such imagery as is frequently used, and similarly applied by way of metaphor and comparison in the Hebrew poetry. Examples of this kind occur in the parable of the deceitful vineyard (Isa. v. 1—7.), and of the useless vine (Ezek. xv. and xix. 10—14.); for under this imagery the ungrateful people of God are more than once described. (See also Ezek. xix. 1—9. Ezek. xxxi. Ezek. xvi. and xxiii.) Moreover, the image must not only be apt and familiar; but it must be also elegant and beautiful in itself; since it is the purpose of a poetic parable, not only to explain more perfectly some proposition, but frequently to give it some animation and splendour. As the imagery from natural objects is in this respect superior to all others, the parables of the sacred poets consist chiefly of this kind of imagery. It is also essential to the elegance of a parable, that the imagery should not only be apt and beautiful, but that all its parts and appendages should be perspicuous and pertinent. Of all these excellencies, there cannot be more perfect examples than the parables that have been just specified: to which we may add the well-known parable of Nathan (2 Sam. xii. 1—4.) although written in prose, as well as that of Jotham (Jud. ix. 7—15.) which appears to be the most ancient extant, and approaches somewhat nearer to the poetical form. It is also the criterion of a parable, that it be consistent throughout, and that the literal be never confounded with the figurative sense: and in this respect it materially differs from that species of allegory, called the continued metaphor. (See Isaiah, v. 1—7.) It should be considered that the continued metaphor and the parable have a very different view. The sole intention of the former is to embellish a subject, to represent it more magnificently, or at the most to illustrate it; that, by describing it in more elevated language, it may strike the mind more forcibly; but the intent of the latter is to withdraw the truth for a moment from our sight, in order to conceal whatever it may contain ungraceful or disgusting, and to enable it secretly to insinuate itself, and obtain an ascendancy as it were by stealth. There is, however, a species of parable, the intent of which is only to illustrate the subject; such is that remarkable one of Ezekiel (chap. xxxi.), of the cedar of Lebanon; than which, if we consider the imagery itself,

PARABOLA.

itself, none was ever more apt or more beautiful: of the description and colouring, none was ever more elegant or splendid; in which, however, the poet has occasionally allowed himself to blend the figurative with the literal description, (see ver. 11, 14—17.): whether he has done this because the peculiar nature of this kind of parable required it, or whether his own fervid imagination alone, which disdained the stricter rules of composition, was his guide, our learned author can scarcely presume to determine.

In the New Testament, the word parable is used variously. In Luke, iv. 23. for a proverb, or adage: in Matt. xv. 15. for a thing darkly and figuratively expressed: in Heb. ix. 9, &c. for a type: in Luke, xiv. 7, &c. for a special instruction: Matt. xxiv. 32. for a similitude or comparison.

Parables, or similitudes, are of two sorts, simple and compound. Those are called simple, in which one thing only is likened or compared to another in this manner: as swallows appear in summer, but in winter retreat; so false friends shew themselves in prosperity, but fly all away, when adversity approaches. Compound similitudes are such wherein one thing is likened or compared to several others, as thus: what light is to the world, physic to the sick, water to the thirsty, and rest to the weary; that is knowledge to the mind. The more exact the agreement is between the things compared, they give the greater beauty and grace to the figure. Ward's Orat. vol. ii. p. 76.

PARABOLA, in *Geometry*, is a curve line made by the common intersection of a conic surface and a plane which cuts it, and is parallel to another plane that touches the same conic surface.

A conic section made by a plane ever so little inclined to the parabola on the one side, is an ellipse; and a section made by a plane inclined ever so little on the other side, is an hyperbola: thus the parabola is the limit between these two curves, to which they both continually approach, while their transverse axes increase more and more; being, as it were, the passage from one of them to the other.

While all the planets move round the sun in orbits of a small, or a moderate degree of excentricity, the comets describe ellipses so astonishingly excentric, that they cannot be distinguished from parabolas during the short time those bodies continue visible.

If a heavy body be projected from the earth's surface, and if we abstract from the resistance of the air, and suppose gravity to act in parallel directions, the path described by the projectile will be a parabola.

Again, if we wish to collect parallel rays of light in a single point by reflecting them from a curve surface; we must employ for this purpose the concave curve generated by the revolution of a parabola about its axis, which will reflect all the parallel rays incident upon it to the focus of the generating parabola.

On all these accounts the parabola merits much attention. We have already treated of it along with the other conic sections; and it only remains that we add here those properties deserving notice which are peculiar to this curve.

PROP. I. Ordinates drawn to two diameters of a parabola from one another's vertices, will cut off equal abscissas. See *Plate of Conics*, (*Parabola*), *fig. 1.*

Let A E be an ordinate to the diameter whose vertex is B, and B D an ordinate to the diameter whose vertex is A: then the abscissas A D and B E will be equal. Draw the tangents A F and B F meeting in F; join A B; draw F K, cutting the curve in H, parallel to A D and B E; also draw H M and K N parallel to B D.

Then (Cor. 31. CONICS)

$$H M^2 : B D^2 :: A M : A D;$$

but on account of the similar triangles K A N, B A D,

$$K N^2, \text{ or } H M^2 : B D^2 :: A N^2 : A D^2;$$

therefore (11. 5. E.)

$$A M : A D :: A N^2 : A D^2;$$

consequently A D is a third proportional to A M and A N; or to F H and H K.

And in like manner it may be shewn that B E is a third proportional to F H and F K;

$$\text{therefore } A D = B E.$$

PROP. II. The part of the diameter of a parabola intercepted between an ordinate (*fig. 2.*), and a tangent drawn from the same point in the curve, is bisected in the vertex of the diameter.

Let the ordinate M A, and the tangent M D, meet the diameter, whose vertex is V: then A V = D V. Draw V L parallel to M D to meet the diameter passing through M: then V L will be an ordinate of that diameter (19. CONICS); therefore (1) M L = D V = V A.

PROP. III. A diameter of a parabola drawn through the intersection of two tangents will bisect the chord that joins the two points of contact.

Let T P and T Q (*fig. 3.*) be two tangents of a parabola; then T K, a diameter drawn through their intersection, will bisect the line drawn between the points of contact. Let P M be an ordinate drawn to the diameter which passes through Q, and let P T meet the same diameter in L. Then (2) M Q = Q L: but T Q is parallel to P M (CONICS, 19.): therefore also P T = T L, and P K = K Q.

PROP. IV. A tangent of a parabola makes equal angles with a diameter and a straight line drawn from the point of contact to the focus.

Let M P (*fig. 4.*) touch a parabola in M, it will make equal angles with a diameter M K, and the line M F drawn to the focus from the point of contact. Let K G be the directrix of the parabola, M K perpendicular to K G, M Q perpendicular to the axis, and let the tangent meet the axis in P. Then (CONICS, Def. 24.) G V = V F; and (2) V P = V Q; therefore P F = G Q = M K = (CONICS, 43.) M F: therefore (5. 1. E.) the angle F M P = the angle F P M = the angle P M K.

PROP. V. A straight line drawn from the intersection of two tangents of a parabola to the focus, will bisect the angle contained by two lines drawn from the focus to the points of contact of the tangents.

Let T P and T Q (*fig. 5.*) be two tangents of a parabola, having its focus at F: then, having drawn T F, P F, Q F, the angle P F T will be equal to the angle T F Q. Draw P M and Q N perpendicular to the directrix, and join T M, T N. In the two triangles T P M, T P F, T P is common; P M is equal to P F (CONICS, 43.); and (4) the angle T P M is = the angle T P F: therefore (4. 1. E.) T M = T F, and the angle T M P = the angle T F P. In like manner, the two triangles Q T N, Q T F, have Q T common; Q N = Q F; and the angle T Q N = angle T Q F: therefore T N = T F, and the angle T F Q = T N Q. And because T M = T F, and T N = T F; therefore T M = T N, and the angle T M N = T N M (5. 1. E.) Now it was shewn that T F Q = T N Q = complement of T N M; and T F P = T M P

PARABOLA

$= T M P =$ complement of $T M N$; therefore $T F Q = T F P$.

Cor.—If a diameter, $O R$, be drawn through T , that diameter, and the line $T F$, will make equal angles with the tangents $T P$ and $T Q$. For the triangle $N T Q$, having been proved equal to the triangle $Q T F$; and the triangle $M P T$ equal to the triangle $F P T$; therefore $2 N T Q + 2 P T F + N T M =$ four right angles (*Cor.* 2. 15. 1. E.): but, $N T M$ being an isosceles triangle, $R O$, perpendicular to the base $M N$, will bisect the vertical angle $N T M$: therefore $2 N T Q + 2 P T F + 2 N T O =$ four right angles, consequently $N T Q + P T F + N T O =$ two right angles. But $N T Q + Q T R + N T O =$ two right angles: consequently $Q T R = P T F$, and $P T R = Q T F$.

Cor. 2.—If two tangents of a parabola (*fig.* 6.), drawn from the extremities of a chord passing through the focus, intersect in T ; then $T F$ is perpendicular to the chord $P Q$. For the angles $Q F T$ and $P F T$ being in all cases equal, they will become right angles when $Q F$ and $F P$ are in one straight line.

PROP. VI.—If from a point in a parabola there be drawn an ordinate to the axis, and likewise a perpendicular to the line touching the curve at that point, the part of the axis which those lines intercept will be equal to half the parameter of the axis.

Let $P M$ (*fig.* 7.) be an ordinate to the axis of a parabola, and $P N$ a perpendicular to the tangent $P Q$; then $M N = \frac{1}{2}$ parameter of the axis. For (*Def.* 20. CONICS) $P M^2 = V M \times \text{param.}$; but (*Cor.* 8. 6. E.) $P M^2 = Q M \times M N$ now $Q M = 2 V M$: therefore $P M^2 = 2 V M \times M N = V M \times \text{param.}$ Consequently $M N = \frac{1}{2}$ param.

PROP. VII.—If $M N$ (*fig.* 8.) be any chord drawn through the focus of a parabola, and $P Q$ likewise drawn through the focus be ordinately applied to the axis: then four times the rectangle $M F \times F N$ will be equal to the rectangle $M N \times P Q$.

Draw $M H$, $N K$ perpendicular to the axis, and $M L$, $N R$, $Q O$ perpendicular to the directrix: then the triangles $F M H$, $F N K$ are equiangular; consequently,

$$M F : F N :: F H : F K.$$

Now $G F = F Q = Q O$, $H G = L M = M F$, and $G K = N R = N F$; therefore, $F H = F Q - M F$; and $F K = N F - F Q$. Consequently, the proportion above will become

$$M F : F N :: F Q - M F : N F - F Q.$$

$$\text{Therefore } 2 M F \times F N = M N \times F Q;$$

$$\text{and } 4 M F \times F N = M N \times P Q.$$

PROP. VIII.—The square of the perpendicular drawn to a tangent of a parabola from the focus, is equal to a rectangle under one-fourth of the parameter of the axis, and the line drawn from the focus to the point of contact of the tangent.

Let $F P$ (*fig.* 9.) be drawn from the focus of a parabola, perpendicular to a tangent, and $M F$ to the point of contact. Then $F P^2 = M F \times F V$, $F V$ being one-fourth part the parameter of the axis. Let the tangent $M P$ meet the axis in R ; draw $M S$ an ordinate of the axis; join $P V$, and make $P G$ perpendicular to $M F$; draw $M O$ parallel to the axis. Then (4) the angle $O M P = F M P = F R P$; therefore $M F R$ is an isosceles triangle, and $F P$, a perpendicular from the vertex upon the base, will bisect the base $M R$: but $R S$ is also bisected in V (2): therefore $P V$ is parallel to $M S$ (2. 6. E.), perpendicular to the axis, and a tangent of the curve at V : therefore $P F$ will bisect the angle $M F V$ (5): hence it is plain, that the

VOL. XXVI.

right-angled triangles $P V G$ and $P F G$ are equal in all respects, and that $F G = F V$. Now $P F^2 = M F \times F G = M F \times F V$ (8. 6. E.).

Of the Description of a Parabola in Plano.—1. When the parameter of the axis is given, any number of points in the curve may be found as follows. Let $A B$ (*fig.* 10.) be the parameter; continue it indefinitely towards B , and draw a perpendicular from B , which prolong indefinitely; bisect $A B$ in C ; then if a series of points, 1, 2, 3, &c. be assumed on the same side of C with B , and from these points, as centres, circles be described through A , to cut the perpendicular in the points $N, N', N'', \&c.$ and the prolongation of $A B$, in $D, D', D'', \&c.$; the perpendiculars $B N, B N', B N'', \&c.$ will be the ordinates of the parabola that belong to the abscissas $B D, B D', B D'', \&c.$; which is manifest, since, from the nature of the circle, we have, $B N^2 = A B \times B D$; $B N'^2 = A B \times B D'$, &c. Hence, if we complete the parallelograms $B M, B M', B M'', \&c.$ the several points $M, M', M'', \&c.$ will be in the curve of the parabola.

2. When the directrix $A B$ (*fig.* 11.), and the focus are given, the curve may be described by finding points in the following manner. Through F draw $G P$ perpendicular to the directrix, then $G P$ will be the axis of the parabola: through any point P of the axis, draw $M m$ parallel to $A B$, and from the centre F , with the distance $G P$, describe a circle to intersect $M m$ in the points M and m ; then will M and m be points of the curve. (CONICS, 43.)

3. When the directrix and the focus are given (*fig.* 12.), the curve may be thus described by a continued motion. Let the ruler $E D H$ be so applied, that the edge $E D$ may be upon the directrix $A B$, and the edge $D H$, which is perpendicular to $E D$, on the same side of $A B$ with the focus F : take a thread or string, exactly equal in length to the part of the ruler $D H$, and fix one end of it in the focus F , and the other end to the extremity of the ruler H : then if a pencil is kept upon the edge $D H$, so as to stretch the thread tight, while the edge $E D$ is made to slide along the directrix, the pencil will describe a parabola. (CONICS, 43.)

But although the curve of a parabola cannot be constructed by very convenient or very simple means; yet it is expressed by an equation of a more simple form than any other curve. If we denote by y the ordinate which corresponds to the absciss x in a parabola, having p for the parameter of its axis; then the equation of the parabola will be $y^2 = p x$. This equation is less complicated than even that of the circle, which curve is on a footing in this respect with the ellipsis and hyperbola. If then the circle be admitted into elementary geometry, while the kindred curves of the conic sections are classed as a higher branch of that science; the reason of this preference of the circle in the construction of geometrical problems is to be sought for in the more easy and simple description of the curve, not in the nature of its equation. But this is a point so well discussed by the admirable sir Isaac Newton, in his "Arithmetica Universalis," when treating of the linear construction of equations, that we must refer our readers to that work.

Quadrature of the Parabola.—The quadrature of the parabola is a discovery that will always be interesting to geometers. It is still the most remarkable instance in the history of mathematical learning, of the exact equality of a curvilinear to a rectilinear space. We are indebted for it to Archimedes, the most inventive geometer of antiquity. The original work in which this discovery is contained, has happily been preserved; and it is the most curious monument extant of the power of inventive genius to employ in the search of truth means the most unconnected with the subject in con-

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templation,

templation, and the least likely to be successful. The treatise of Archimedes on the quadrature of the parabola consists of two parts: in the first part the author details the reasonings, founded on mechanical considerations, and the nature of the lever, by which his discovery was originally made: in the second part, he demonstrates the same thing more naturally from principles purely geometrical. The whole treatise is well worth the attention of mathematicians: but in this place we must confine ourselves to demonstrate concisely the discovery of Archimedes. This we shall do in a manner strictly rigorous, and not differing essentially from the mode of investigation traced out by the illustrious inventor.

We call equidistant parallel lines those that cut any straight line that crosses them into equal parts.

PROP. I. If a triangle ACB (*fig. 13.*) be inscribed in a segment of a parabola, by drawing a diameter DC to bisect the base; and if a polygon $AMCNB$ be likewise inscribed in the same segment by drawing four equidistant diameters which will divide the base into four equal parts; the excess of the polygon above the triangle will be one-fourth part of the triangle.

At A draw a tangent of the curve to meet the diameters EM and DC in H and K . Because AD is bisected in E , AC will be bisected in S ; therefore $HM = MS$ and $DC = CK$ (2). Therefore the triangle $AHS =$ twice the triangle $AMS =$ the triangle AMC ; but the triangle $AHM = \frac{1}{2}$ of the triangle ACK (19. 6. E.) $= \frac{1}{2}$ of the triangle ACD . For like reasons the triangle $CNB = \frac{1}{2}$ of the triangle CDB . Therefore the sum of the two triangles AMC and CNB , which is the excess of the polygon $AMCNB$ above the triangle ACB , is equal to one-fourth part of the triangle ACB .

PROP. II. If a triangle ACB (*fig. 14.*) be inscribed in a segment of a parabola by drawing a diameter AB to bisect the base of the segment; the excess of the segment above the triangle will be less than the triangle.

Because AB is ordinately applied to the diameter DC , therefore AB is parallel to FG , a tangent of the curve at C ; draw AF and BG parallel to CD : then these lines will be diameters, and the part of each above the vertex being without the curve, the parallelogram $AFGD$ will contain the segment of the parabola. Now the excess of the parallelogram above the triangle ACB , is exactly equal to the triangle; therefore the excess of the segment above the triangle is less than the triangle.

PROP. III. To investigate the area of a segment of a parabola.

Let ACB be a segment of a parabola, and let the triangle ACB (*fig. 16.*) be inscribed in it by drawing the diameter DC to bisect the base of the segment; the area of this triangle we shall denote by a .

Draw the diameters EN, FQ , to bisect the parts AD, BD ; by which means the base AB will be divided into 4, or 2^2 , equal parts, and a polygon $ANCQB$ will be inscribed in the segment, the excess of which polygon above the triangle ACB is equal to one-fourth part of the triangle (first prop.); consequently the area of the same polygon will be equal to

$$a + \frac{a}{4},$$

which space is less than the segment. Again, the excess of the segment ANC above the triangle ANC , is less than the triangle ANC (2d prop.); and the excess of the segment CQB above the triangle CQB , is less than the triangle CQB ; therefore the sum of these two excesses, which

is equal to the excess of the segment ACB above the polygon $ANCQB$, will be less than the sum of the two triangles ANC and CQB ; that is, it will be less than $\frac{a}{4}$ (first prop.) Hence the space

$$a + \frac{a}{4} + \frac{a}{4}$$

will be greater than the segment ACB .

And if we inscribe another polygon $AMNOCQRB$ in the segment, by drawing diameters to bisect the intervals between the diameters of the last polygon, so as to divide the base of the segment into 8, or 2^3 , equal parts; then the excess of this polygon above the last polygon will be equal to the sum of the triangles AMN, NOC, CQB, QRB ; but the sum of the triangles AMN and NOC is equal to one-fourth part of the triangle ANC ; and the sum of the triangles CQP and QRB is equal to one-fourth part of the triangle CQB (first prop.); therefore the excess above-mentioned is equal to one-fourth part of the sum of the triangles ANC and CQB ; that is, it is equal to $\frac{1}{4}$ of $\frac{a}{4}$; or to $\frac{a}{4^2}$. Therefore the area of the polygon formed by dividing the base into 8, or 2^3 , equal parts, will be equal to

$$a + \frac{a}{4} + \frac{a}{4^2};$$

which space is less than the segment ACB . Again, the excess of the segment ACB above the same polygon, is less than the sum of the triangles AMN, NOC, CPQ, QRB ; that is, it is less than $\frac{a}{4^2}$; therefore the space

$$a + \frac{a}{4} + \frac{a}{4^2} + \frac{a}{4^2}$$

is greater than the segment ACB .

In like manner, if we continue to inscribe new polygons in the segment, by drawing diameters which shall bisect the intervals between the diameters of the preceding polygons, after n bisections, which will divide the base of the segment into 2^n equal parts, we shall come to an inscribed polygon whose area is equal to

$$a + \frac{a}{4} + \frac{a}{4^2} + \frac{a}{4^3} \dots \dots \frac{a}{4^{n-1}};$$

which is therefore less than the segment ACB . But we can prove, as is done above, that the excess of the segment

above the polygon is less than $\frac{a}{4^{n-1}}$; therefore the space

$$a + \frac{a}{4} + \frac{a}{4^2} + \frac{a}{4^3} \dots \dots + \frac{a}{4^{n-1}} + \frac{a}{4^{n-1}}$$

will be greater than the segment.

Now, if from the area of the polygon, *viz.*

$$a + \frac{a}{4} + \frac{a}{4^2} + \frac{a}{4^3} \dots \dots + \frac{a}{4^{n-1}},$$

we subtract its fourth part, the three-fourths which remain will be equal to $a - \frac{a}{4}$; therefore the area of the polygon

will be equal to $\frac{4a}{3} - \frac{1}{3} \cdot \frac{a}{4^{n-1}}$, which is less than the segment; and the space proved above to be greater than the

segment will be equal to $\frac{4a}{3} + \frac{2}{3} \cdot \frac{a}{4^{n-1}}$. Between these

PARABOLA.

two limits the area of the parabolic segment is contained, how great soever may be the number of bisections denoted by n .

But $\frac{4a}{3}$ is the only quantity which, for every value of n , is contained between the foregoing limits, *viz.*

$$\frac{4a}{3} - \frac{1}{3} \cdot \frac{a}{4^{n-1}}$$

$$\frac{4a}{3} + \frac{2}{3} \cdot \frac{a}{4^{n-1}}$$

For it is manifest that n may be taken so great, that the difference between the two limits shall be less than any assignable space. Therefore the area of the segment of the parabola is equal to $\frac{4a}{3}$; that is, it is equal to four third parts

of the triangle inscribed in it, by drawing a diameter to bisect the base: or, which is the same thing, it is equal to four third parts of the triangle that has the same base and altitude with the segment.

The area of a parallelogram circumscribed about a segment of a parabola (*fig. 15.*), being double of the triangle inscribed in the segment; the area of the segment will be two-third parts of the parallelogram.

The modern analysis furnishes a much shorter way of determining the area of a parabola than the prolix though elegant method of the ancient geometers. Let p denote the parameter of a diameter of a parabola; y an ordinate; x the corresponding absciss; and m the sine of the angle in which the ordinate cuts the diameter; then the fluxion of the area of the semi-segment of the parabola will be $my\dot{x}$; but $y^2 = px$, and $y = p^{\frac{1}{2}}x^{\frac{1}{2}}$; therefore the fluxion of the semi-segment is $m p^{\frac{1}{2}} x^{\frac{1}{2}} \dot{x}$; and the fluent, or the area itself, is $\frac{2}{3} m p^{\frac{1}{2}} x^{\frac{3}{2}}$; and by substituting y for $p^{\frac{1}{2}} x^{\frac{1}{2}}$, the semi-segment of the parabola is $\frac{2}{3} m y x$; and the whole segment is equal to $\frac{2}{3} \times 2 m y x$, that is, to two-thirds of the circumscribing parallelogram.

Rectification of the Parabola.—About the year 1659, Van Heuraet, a Dutch mathematician, invented a method of reducing the rectification of any proposed curve to the quadrature of another curve derived from the former by a geometrical construction; and in this way he shewed that the rectification of the parabola could be accomplished by the quadrature of the hyperbola. This discovery is explained by the author in a letter to Francis Schooten, inserted by that mathematician in the edition of Des Cartes' geometry, which he published in 1659. Inventions of this kind, although they might be very interesting at the time they were first made known to the public, are now only objects of curiosity to such as wish to inquire into the history of mathematical learning; we shall therefore proceed to investigate the length of an arc of a parabola, by the general method now in use.

Let $4p$ denote the parameter of the axis of a parabola; y an ordinate to the axis; x the corresponding absciss; s the length of the arc estimated from the vertex; then, as is proved in the method of fluxions, $\dot{s} = \sqrt{\dot{x}^2 + \dot{y}^2}$; but the equation of the curve is $y^2 = 4px$; therefore $y = 2\sqrt{px}$;

consequently $\dot{y} = \dot{x} \sqrt{\frac{p}{x}}$; and $\dot{y}^2 = \dot{x}^2 \cdot \frac{p}{x}$; therefore, by

substitution, $\dot{s} = \dot{x} \sqrt{1 + \frac{p}{x}} = \frac{x\dot{x} + p\dot{x}}{\sqrt{x^2 + px}}$.

Suppose $z = \sqrt{x^2 + px}$; then by taking the fluxions

$$\dot{z} = \frac{x\dot{x} + \frac{1}{2}p\dot{x}}{\sqrt{x^2 + px}}; \text{ hence } \dot{s} = \dot{z} + \frac{1}{2}p \cdot \frac{\dot{x}}{\sqrt{x^2 + px}}; \text{ and}$$

by taking the fluents, and restoring the value of z , we get

$$s = \sqrt{x^2 + px} + \frac{1}{2}p \times \text{hyp. log.} \frac{x + \frac{1}{2}p + \sqrt{x^2 + px}}{\frac{1}{2}p};$$

which is the expression of the length of an arc of a parabola estimated from the vertex, cut off by an ordinate corresponding to the absciss x . I.

The area of a frustum, or zone, of a parabola, included by two parallel right lines, and the intercepted curves of the parabola, may be found by the following rule; *viz.* To one of the parallel ends add the quotient arising from the division of the square of the other by the sum of the said ends; multiply the sum by the altitude of the frustum, or distance of the ends; and $\frac{2}{3}$ ds of the product will be the area. Or, divide the difference of the cubes of the diameters by the difference of their squares, and multiply the quotient by $\frac{2}{3}$ ds of

the altitude. Then, $D + \frac{DD}{D+d} \times \frac{2}{3}a$, or $d + \frac{DD}{D+d}$

$$\times \frac{2}{3}a, \text{ or } \frac{D^3 - d^3}{D^2 - d^2} \times \frac{2}{3}a = \text{the area; } D, d \text{ being the two}$$

ends and a the altitude. For by a property of the parabola,

$$DD - dd : a :: \left\{ \begin{array}{l} DD : \frac{aDD}{DD - dd} \\ dd : \frac{add}{DD - dd} \end{array} \right\} = \text{the altitudes}$$

of two complete segments, whose bases are the ends D, d of the frustum; and consequently their difference, or the

$$\text{frustum, is } \frac{2}{3}a \times \frac{D^3 - d^3}{D^2 - d^2} = \frac{2}{3}a \times \frac{DD + Dd + dd}{D + d} =$$

$$\frac{2}{3}a \times D + \frac{dd}{D+d} = \frac{2}{3}a \times d + \frac{DD}{D+d}.$$
 Hence a pa-

rabolic frustum is equal to a parabola of the same altitude, and whose base is equal to the end of the frustum, increased by a third proportional to the sum of the ends and the other. Consequently in the one end DC (*Plate XXIII. Miscellany, fig. 9.*) produced of a parabolic frustum ABCD, take CE = the other end AB; raise EF perpendicular to EC and = CD; draw DF, and perpendicular to it FG meeting CE produced in G; then, if upon the base CG be described any parabola CHG, touching the line ABH, it will be equal to the frustum ABCD. For

$$CG = CE + EG = AB + EG = AB + \frac{EF^2}{DE} =$$

$$= AB + \frac{DC^2}{DC + AB}. \text{ Hutton's Mensuration.}$$

PARABOLA, *Quadrature of the.* See QUADRATURE, and the article PARABOLA *supra*.

PARABOLA, *Rectification of the.* See RECTIFICATION, and PARABOLA.

PARABOLA, *Centre of gravity of a.* See CENTER of Gravity.

PARABOLA, *Centre of oscillation of the.* See CENTER of Oscillation.

PARABOLAS of the higher kinds, are algebraic curves, defined by $a^m - 1 x = y^m$. *E. gr.* by $a^2 x = y^2$, $a^3 x = y^3$, $a^4 x = y^4$, $a^5 x = y^5$, &c. See CURVE.

Some call these paraboloids: more particularly, if $a^2 v = y^2$, they call it a *cubical* paraboloid. If $a^2 x = y^2$, &c. they call it a *biquadratic* paraboloid, or a *surfolidal* paraboloid. And in respect of these, the *parabola of the first kind*, above explained, they call the *Apollonian*, or *quadratic* parabola. Those curves are likewise to be referred to parabolas, in which $a x^{m-1} = y^m$; as *e. gr.* $a x^2 = y^2$, $a x^3 = y^3$, which some call *semi-parabolas*. They are all comprehended under the common equation, $a^m \times x^m = y^m$, which also extends to other curves, *v. gr.* to those in which $a^2 x^2 = y^2$, $a^2 x^3 = y^3$, $a^2 x^4 = y^4$.

Since in parabolas of the higher kinds, $y^m = a^{m-1} x$; if any other semi-ordinate be called v , and the abscissa corresponding to it z , we shall have $v^m = a^{m-1} z$, consequently $y^m : v^m :: a^{m-1} x : a^{m-1} z$, *i. e.* $x : z$. It is a common property, therefore, of these parabolas, that the powers of the ordinates are in the ratio of the abscissas. But in semi-parabolas, $y^m : v^m :: a x^{m-1} : a z^{m-1} :: x^{m-1} : z^{m-1}$. Or the powers of the semi-ordinates are as the powers of the abscissas, one degree lower. *E. gr.* In cubical semi-parabolas the powers of the ordinates y^3 and v^3 are as the squares of the abscissas x^2 and z^2 .

PARABOLA, *Helicoid*. See HELICOID.

PARABOLA, *Osculatory*, in *Geometry*, is used particularly for that parabola which not only osculates or measures the curvature of any curve at a given point, but also measures the variation of the curvature at that point. See M'Laurin's Appendix to his Algebra, p. 17. Cramer, *Analys. des Lignes Courbes*, p. 559. See also CURVATURE.

A curve, strictly speaking, may have an indefinite number of osculatory parabolas at any of its points; but the appellation may be restrained to that particular parabola which meets the curve so closely, that no other parabolic arc can be drawn between them; and this parabola will measure the variation of curvature of the curve at that point. See VARIATION of Curvature.

PARABOLA, *Resistance of a*. See RESISTANCE.

PARABOLAN, PARABOLANUS, among the *Ancients*, was a sort of gladiator, called also the *confessor*.

The name was given them from the Greek, $\piαραβολοι$, of $\betaαλλω$, to throw, *precipitate*; because they threw themselves on danger and death.

PARABOLANI, or PARABOLARI, is also used in *Church History*, for a set of people, especially in Alexandria, who devoted themselves to the services of churches and hospitals.

The parabolani were not allowed to withdraw themselves from their function, which was the attendance on the sick. They made a kind of fraternity, amounting sometimes to six hundred persons, dependent on the bishop.

The design of their institution was that the diseased, especially those infected with the plague, might not be without attendance.

PARABOLIC ASYMPTOTE, in *Geometry*, is used for a parabolic line approaching to a curve, so that they never meet; yet by producing both indefinitely, their distance from each other becomes less than any given line.

There may be as many different kinds of these asymptotes as there are parabolas of different orders.

When a curve has a common parabola for its asymptote, the ratio of the subtangent to the abscissa approaches continually to the ratio of two to one, when the axis of the parabola coincides with the base; but this ratio of the subtangent to the abscissa approaches to that of one to two, when the axis is perpendicular to the base. And by observing the limit to which the ratio of the subtangent and

absciss approaches, parabolic asymptotes of various kinds may be discovered. See M'Laur. Flux. art. 337. See also ASYMPTOTE.

PARABOLIC CONOID, or PARABOLOID, a solid figure generated by the rotation of a parabola about its axis.

The circles conceived to be the elements of this figure, are in an arithmetical proportion, decreasing towards the vertex.

A parabolic conoid is to a cylinder of the same base and height as 1 to 2; and to a cone of the same base and height, as $1\frac{1}{2}$ to 1. See CONOID.

I. The curve surface of a paraboloid may be found by the following rules.

Rule 1.—To the square of the ordinate, or semi-diameter of the base, add four times that of the axis; and the square root of the sum will be the tangent to the curve at the base, and intercepted by the axis produced; call this tangent t ; then we shall have $t = \sqrt{yy + 4xx}$, x being the axis, and y the ordinate. Then by the rule at the close of the article PARABOLA, find the area of the frustum of a parabola, whose parallel ends are t and y , and its altitude $= y$, and this area multiplied by 3.14159 will be the curve surface of the paraboloid ABC required. Plate XXIII. *Miscellany*, fig. 10.

Calling the ordinate y , the absciss x , the curve z , and the parameter p ; also $a = 3.14159$; the equation of the generating parabola will be $px = yy$; hence $p\dot{x} = 2y\dot{y}$, and the fluxion of the surface $\dot{s} = 2ay\dot{z} = 2ay\sqrt{\dot{y}^2 + \dot{x}^2} = \frac{4ay\dot{y}}{p}\sqrt{\frac{1}{4}pp + yy}$; and, by taking the correct fluents,

the surface s will be $= \frac{4a}{3p} \times (\frac{1}{2}pp + yy)^{\frac{3}{2}} - \frac{1}{2}app = \frac{2}{3}ay \times \frac{(yy + 4xx)^{\frac{3}{2}} - y^3}{4xx}$

$= \frac{2}{3}ay \times \frac{t^3 - y^3}{t^2 - y^2} = \frac{2}{3}ay \times \frac{t + y}{t + y} = \frac{2}{3}ay \times t$

$= \frac{2}{3}ay \times \left(t + \frac{yy}{t+y}\right) = \frac{2}{3}ay \times \left(y + \frac{ty}{t+y}\right)$; putting

$t = \sqrt{yy + 4xx} = BE$, the tangent to the curve at the extremity of the ordinate, and intercepted by the axe produced. Q. E. D.

Corol. 1.—In CB produced take BG = the tangent BE; erect GH perpendicular to GB and equal to BD; join DH, and perpendicular to it HI, meeting BG produced in I; take BK = $\frac{1}{2}$ BI; and upon KC describe a circle meeting BL perpendicular to BC in L. And the circle whose radius is BL, will be equal to the curve surface of the paraboloid BAC.

For, by the construction, $BL^2 = KB \times BC = BC \times \frac{1}{2}BI = \frac{2}{3}BD \times (BG + GI) = \frac{2}{3}BD \times \left(BE + \frac{GH^2}{GD}\right) = \frac{2}{3}BD \times \left(BE + \frac{BD^2}{BE + BD}\right) = \frac{2}{3}y \times \left(t + \frac{yy}{t+y}\right)$.

Corol. 2.—The curve surface of the paraboloid is to the area of its circular base, as IK is to BD.

For the base is $= a \times BD^2$, and the curve surface $= a \times \frac{2}{3}IB \times BD = a \times IK \times BD$.

Corol. 3.—If M be the focus of the generating parabola, and there be taken AN = MC = AD + AM, and the double

PARABOLIC CONOID.

double ordinates P N O, Q M R be drawn; the surface generated by B A C, will be to the area P Q R O, as $a = 3.14159$, to 1, or as the circumference of a circle to its diameter.

For the surface is $= \frac{4a}{3p} \times (\frac{1}{4}pp + yy)^{\frac{3}{2}} - \frac{1}{6}app = \frac{4a}{3p} \times (\frac{1}{4}pp + px)^{\frac{3}{2}} - \frac{1}{6}app = \frac{4}{3}a \times (\frac{1}{4}p + x) \sqrt{\frac{1}{4}pp + px} - \frac{1}{6}app = \frac{4}{3}a \times MC \sqrt{MC} \times p - \frac{1}{6}app = \frac{4}{3}a \times AN \times NO - \frac{1}{6}a \times AM \times MR = a \times (PAO - QAR) = a \times PQRO.$

Rule 2.—Divide the difference between the cube of the tangent and the cube of the ordinate, by four times the square of the axis; multiply the quotient by $\frac{1}{3}$ ds of the ordinate, and the product again by 3.14159 for the surface. Thus, $\frac{t^3 - y^3}{4x} \times \frac{1}{3}cy =$ the surface; where $t = \sqrt{yy + 4xx}$ is the tangent, x the absciss or axis, y the ordinate or semi-diameter of the base, and $c = 3.14159$.

II. The curve surface of the frustum of a paraboloid, having its altitude and the diameters of its ends given, may be thus found.

Divide the difference of the squares of the semi-diameters of the ends, by their distance, or by the altitude of the frustum; or divide the difference of the squares of the whole diameters, by four times the altitude; and the quotient will be the parameter of the axis of the generating parabola.

Find the two sums arising from the addition of the square of the parameter and the square of each diameter; multiply each sum by its root, and divide the difference of the products by the parameter; multiply the quotient by 3.14159, and $\frac{1}{6}$ th of the product will be the surface of the frustum.

That is, $\frac{(pp + DD)^{\frac{3}{2}} - (pp + dd)^{\frac{3}{2}}}{p} \times \frac{1}{6}c =$ the surface; D and d being the diameters of the ends, $p =$ the parameter $= \frac{DD - dd}{4a}$, $a =$ the altitude, and $c = 3.14159$.

In the investigation of rule 1. of the last problem, it appears that $\frac{4a}{3p} \times (\frac{1}{4}pp + yy)^{\frac{3}{2}} - \frac{1}{6}c p p$ or $\frac{c}{6p} \times (pp + DD)^{\frac{3}{2}} - \frac{1}{6}c p p$ is the surface of the segment whose base diameter is D ; and $\frac{c}{6p} \times (pp + dd)^{\frac{3}{2}} - \frac{1}{6}c p p =$

that whose diameter is d ; and, by taking the difference, $\frac{1}{6}c \times \frac{(pp + DD)^{\frac{3}{2}} - (pp + dd)^{\frac{3}{2}}}{p}$, will express the surface of the frustum, the diameters of whose ends are D, d .

And that the parameter is $= \frac{DD - dd}{4a}$, appears thus: Since $pX = YY$, and $px = yy$, therefore $pX - px = YY - yy$, and $p = \frac{YY - yy}{X - x} = \frac{DD - dd}{4a}$.

III. The solidity of any segment of a paraboloid, whose base is either perpendicular or oblique to the axis, may be found by the following rule. For both right and oblique segments, multiply the base by half the altitude, and the product will be the content. Let b denote the base, a the altitude, x any variable absciss, or part of the diameter drawn through

the middle of the base, and s the sine of the angle formed by this diameter and its ordinate, to the radius 1.

Then as $a : sx :: b : \frac{bsx}{a}$ the section corresponding to the absciss x . Therefore $\frac{sx}{a} \times bsx$ is the fluxion of the

solid; and, by taking the fluent, the solid itself will be $\frac{bssxx}{2a}$; which, when $sx = a$, becomes $\frac{1}{2}ab$ for the whole

solid, whose base is b and altitude a . *Q. E. D.*

Corol. 1.—A paraboloid is equal to half a prism of the same base and altitude. Also a prism, a semi-spheroid or semi-sphere, a paraboloid, and a pyramid, all of equal bases and altitudes, are to one another as the numbers 1, $\frac{2}{3}$, $\frac{2}{3}$, $\frac{1}{3}$, or as 6, 4, 3, 2; and are, therefore, in a discontinued geometric proportion, whose ratio is that of 3 to 2. Which will appear by comparing the above value of the paraboloid with those of the other solids.

When the base of the paraboloid is perpendicular to the axis, or when the paraboloid is right, the semi-spheroid, or semi-sphere, will also be right; and the prism and pyramid will be the right or common cylinder and cone, the common base being a circle. But if the paraboloid be oblique, by having its base oblique to the axis, the common base of all the solids will be an ellipse; the semi-spheroid will also be oblique, by having its base oblique to the axis; and the prism and pyramid may be either right or oblique.

Corol. 2.—If upon the diameter NP = BC = the conjugate axis of the section AB, be described a circle; (*Plate XXIII. Miscellany, fig. 11*) the oblique paraboloid, or segment AHB, will be equal to the right paraboloid whose base is that circle, and its altitude MH. For, the diameter of the circle being the conjugate axis of the base of the oblique paraboloid, the circle will be to that base, as the conjugate is to the transverse axis, that is, as CB to AB; but HK is to HM in the same proportion of CB to AB; consequently HK \times elliptical base AB will be = HM \times circular base NP or BC.

It is also evident, that all segments, right or oblique, having the same vertex H, and the transverse axes of whose bases pass through the same point M, and terminate in A, C, O, P, parallel to and equidistant from HM, will be equal to one another.

Corol. 3.—If B, b denote the two bases, or parallel ends, of the frustum of a paraboloid, either right or oblique; and d the distance of the ends, or the altitude of the frustum; then $\frac{1}{2}d \times (B + b)$ will be the solidity of the frustum.

For, by this problem, $\frac{1}{2}AB$ is the segment whose base is B and altitude A ; and $\frac{1}{2}ab$ is that whose base is b and altitude a ; therefore the frustum, or the difference of the segments, is $\frac{1}{2}AB - \frac{1}{2}ab$. But, by the nature of the

paraboloid, $B - b : d$ or $A - a :: B : A = \frac{Bd}{B - b}$, and

$B - b : d :: b : a = \frac{bd}{B - b}$; which values of A and a

being substituted for them, we obtain $\frac{1}{2}AB - \frac{1}{2}ab = \frac{dB^2 - db^2}{2B - 2b} = \frac{1}{2}d \times (B + b)$.

Corol. 4.—Let A G B b be a right frustum, HI the diameter to the double ordinate AB, and HK perpendicular to AB, that is, HK the altitude of the oblique segment AHB. Then the value of the oblique segment AHB is $\frac{1}{2}n \times AB \times BC \times HK$, putting $n = .785398$.

But,

But, by the property of the figure, $DB^2 - DC^2 : DB^2 - DI^2 :: AC : HI = \frac{DB^2 - DI^2}{DB^2 - DC^2} \times AC$;
 hence $HM = HI - IM = HI - \frac{1}{2} AC = \frac{DB + DC}{DB - DC}$
 $\times \frac{1}{4} CA = \frac{BC \times CA}{8 DI}$; and, by similar triangles,
 $AB : CB :: HM : HK = \frac{HM \times CB}{AB} = \frac{AC \times CB^2}{AB \times 8 DI}$;
 therefore the oblique segment AHB , or $\frac{1}{2} n \times AB \times CB \times HK$, will be $\frac{CB^3}{8 DI} \times \frac{1}{2} AC \times n = \frac{CB^3}{bB^2 - AG^2}$
 $\times AC \times \frac{1}{2} n$.

Or, by substituting the value of AC , viz. $\frac{DB^2 - DC^2}{DB^2}$
 $\times DE = \frac{CB \times 2 DI}{DB^2} \times DE$, instead of it, the same
 segment AHB will be $\frac{CB^3}{8 DB^2} \times DE \times n = \frac{CB^3}{bB^2} \times$
 $DE \times \frac{1}{2} n$.

Corol. 5.—If from $DE \times bB^2 \times \frac{1}{2} n$, the value of the
 right segment DEB , be taken the above value of the ob-
 lique segment AHB , there will remain $\frac{bB^3 - CB^3}{bB^2} \times$
 $DE \times \frac{1}{2} n$, or $\frac{bB^3 - CB^3}{bB^2 - AG^2} \times AC \times \frac{1}{2} n$ for the value
 of the greater ungula AB .

Corol. 6.—And if from the said value of the oblique seg-
 ment AHB , be taken that of the right segment AEG ,
 viz. $\frac{AG^3}{bB^2} \times DE \times \frac{1}{2} n$, or $\frac{AG^3}{bB^2 - AG^2} \times AC \times \frac{1}{2} n$,
 there will remain $\frac{CB^3 - AG^3}{bB^2} \times DE \times \frac{1}{2} n$, or $\frac{CB^3 - AG^3}{bB^2 - AG^2}$
 $\times AC \times \frac{1}{2} n$ for that of the less ungula AGB . Hut-
 ton's Mensuration.

PARABOLIC Cuneus, a solid figure, formed by multiplying
 all the DB 's, (*Plate XIII. Analysis, fig. 3.*) into the D 's:
 or, which amounts to the same, on the base APB erect a
 prism, whose altitude is AS : this will be a parabolical
 cuneus, which of necessity will be equal to the parabolical
 pyramidoid; inasmuch as the component rectangles in one are
 severally equal to all the component squares in the other.

PARABOLIC Pyramidoid, a solid figure, generated by
 supposing all the squares of the ordinate applicates in the
 parabola so placed, as that the axis shall pass through all
 their centres at right angles; in which case the aggregate
 of the planes will form the parabolic pyramidoid.

The solidity of this body is had by multiplying the base
 by half the altitude; the reason of which is obvious; for
 the component planes being a series of arithmetical pro-
 portionals beginning from 0, their sum will be equal to the
 extremes multiplied by half the number of terms, that is,
 in the present case, equal to the base multiplied by half the
 height.

PARABOLIC Space, the space or area contained between
 any entire ordinate, and the curve of the parabola.

The parabolic space is to the rectangle of the ordinate
 into the abscissa, as 2 to 3: to a triangle inscribed on

the ordinate as a base whose altitude is the abscissa, the
 parabolic space is as 4 to 3.

The segment of a parabolic space, is that space included
 between two ordinates. See **PARABOLA**.

Quadrature of a parabolical segment. See **QUADRATURE**,
 and **PARABOLA** *Supra*.

PARABOLIC Speculum or Mirror. See **MIRROR**.

PARABOLIC Spindle. See **PYRAMOID** and **SPINDLE**.

PARABOLIC Spiral, in Conics. See **HELICOID Parabola**.

PARABOLIFORM CURVES, a name sometimes given
 to the parabolas of a higher kind.

PARABOLOIDES, parabolas of the higher kinds.
 See **PARABOLAS of the higher kind**.

PARABOLOID, Centre of gravity of a. See **CENTER**.

PARABOLOID, Quadratic. Cubical paraboloid, surfolidal
paraboloid. See **PARABOLAS of the higher kinds**.

PARABOSCO, GIROLAMO, in *Biography*, organist of
 St. Mark's cathedral at Venice, and according to Crefcembeni
 (Stor. del Vulg. Poef.) a most admirable performer. "Who-
 ever," says Ant. Fran. Doni, (*Libraria Tratt. imo.*) "is en-
 dowed by heaven with the power of receiving and communicat-
 ing pleasure, should imitate Parabosco; who, not content with
 that musical excellence, with which he has given such delight,
 both in public and private, and acquired such fame, has
 afforded equal pleasure by his literary and poetical talents,
 in the publication of works, that are as much esteemed for
 their wit and learning, as originality." He then gives a list
 of his tragedies, comedies, miscellaneous poems, and letters;
 adding, that "he hoped his novels would soon appear in
 print, which, for their invention and style, he thought the
 most admirable productions of the kind that he had ever
 read." They were afterwards published under the title of
 "Gli Disporti," &c. 1586; and we purchased them at an
 extravagant price, as curiosities, at the sale of the late Hon.
 Topham Beauclerc's books; but find, on perusal, that Doni
 spoke of them as he did, perhaps, of his musical abilities,
 with the partiality of a friend. Several of the motets and
 madrigals of Parabosco are inserted in the collections that
 were published about the middle of the sixteenth century,
 some of which we took the trouble to score, but found in
 them no subject; and but little design or contrivance. And
 if his literary character did not impose on his friends, and on
 the writers who speak of his musical productions, his fame
 as a composer must have been established on works superior
 to these, which are mere *remplissage*, or notes heaped on each
 other totally devoid of meaning with respect to melody.

PARABRAMA, in *Mythology*, is a name given to the
 first of the gods of India.

PARABYSTE was one of the five principal civil tri-
 bunals of Athens.

PARAC, in *Geography*, a town of the island of Borneo;
 200 miles N. of Banjar-Massim.

PARACA, a town of Peru, in the audience of Lima;
 12 miles S. of Pisco.

PARACELS, or PRACELS, a chain of small islands,
 with rocks and shoals, in the Chinese sea, parallel to, and
 about 60 miles E. of the coast of Cochinchina. This range
 is about 300 miles long, and 60 broad from N. lat. $11^{\circ} 40'$
 to $16^{\circ} 10'$, and E. long. 110° to 111° . The navigation is
 dangerous, on account of several currents among them.

PARACELSISTS. See *Fire Philosophers*.

PARACELSUS, in *Biography*, an extraordinary ad-
 venturer in chemistry and physic, in the early part of the
 sixteenth century, is said to have been born at Einsidlen, a
 little village near Zurich, in Switzerland, in 1493; and his
 father, called William de Hohenheim, is supposed to have
 been the natural son of a grand master of the Teutonic
 order,

PARACELSUS.

order, and a practitioner in medicine in Carinthia, in the beginning of the following century. With a view of dignifying himself and his family, his son assumed the names of *Philippus*, *Aureolus*, *Theophrastus*, *Paracelsus*, *Bombastus de Hohenheim*. But Thomas Erastus affirms, that there was no family bearing any of these names in that part of Switzerland, either noble or ignoble; and Haller was credibly informed, that Paracelsus was a native of Gais, in the canton of Appenzel, and of an obscure family of the name of Hochener, which was still existing there. His father gave him early a turn for his own pursuits, and put him under the care of John Trithemius, abbot of Spanheim, at that time eminent for his knowledge of the spagiric art, as chemistry in its infancy was called. He afterwards followed another master of the art, Sigismund Fugger, and from both these he learned many secrets. If any credit is due to his own statements, he received instructions from several other tutors, whom he has named; although in one of his treatises, he denies having had any instructors at all. He very soon commenced a sort of rambling life; for he says, he had examined the principles of the medical art with great attention, and found them defective and erroneous in all points, and therefore he resolved, after having visited the schools of France, Italy, and Germany, to travel in pursuit of medical truth, and not only to search for it among physicians, and other learned persons, but among barber-surgeons, monks, conjurers, old women, and quacks of every description. He makes a pompous display of the names of all the countries which he thus visited, during a peregrination of several years, and of the important acquisitions in science which he thus collected, with the view of impressing on the world the highest opinion of his superiority; for he seems to have possessed the talents of imposing and successful quackery in an eminent degree. Even the learned Erasmus appears to have consulted him, especially after a fortunate cure of his friend Frobenius, the celebrated printer of Basle, in an attack of gout, (although the latter died of apoplexy a few months afterwards,) and Oporinus, an eminent citizen of that place, left his family to follow him. In the course of his travels he had doubtless collected much information concerning metallic chemistry; which, however, he perverted to the vain search of the philosopher's stone; and by the bold use of some active medicines, especially mercury and opium, the administration and properties of which were not understood by medical men, he had certainly effected many cures, where ordinary medicine had failed; and while these successful cases were blazoned forth with the usual exaggeration, the unsuccessful ones, and the mistakes were long passed over in silence. To such a height, however, his reputation had been raised in Switzerland, that the magistrates of Basle were induced to engage him, at a large salary, to fill the chair of medicine in their university. In the years 1527 and 1528, he gave lectures daily, sometimes in barbarous Latin, but more frequently in German; and although he at first acquired several enthusiastic adherents, yet the barbarism, vanity, and extravagance of his lectures at length disgusted the students, and he was soon left without an audience. Indeed nothing could exceed the ridiculous pride and bombast, with which he assumed the supremacy, the monarchy of medicine, and the contempt which he affected towards all the teachers and universities in the world. Seated in his professorial chair, at his first lecture, he publicly burnt the works of Galen and Avicenna, averring that his cap contained more knowledge than all physicians, and that the hair of his beard had more experience than all the universities. "Greeks, Romans, French, and Italians," he exclaimed; "you Avicenna, you Galen, you Rhazes, you

Mesue; you doctors of Paris, you of Montpellier, you of Swabia, you of Misnia, you of Cologne, you of Vienna; and all you throughout the countries that are washed by the Danube and the Rhine, and you who inhabit the islands of the sea, Athenian, Greek, Arab, and Jew; you shall follow and obey me, I am your king, the monarchy of physic is mine," &c. That such an extravagant enthusiast should not long retain his professorial chair might be anticipated. A quarrel with the magistrates of Basle, on account of a decision against him in respect to a demand of fees, which was deemed exorbitant, increased his displeasure, and he suddenly quitted that place in 1528. From this time he resided chiefly in Alsace, and in different parts of Germany, leading a life of extreme intemperance, in the lowest company, being frequently in a state of continued intoxication for many days and nights in succession. Nevertheless he still maintained his reputation by extraordinary cures, occasionally effected by his powerful remedies, though his failures were equally conspicuous. But the most signal failure of his boasted remedies occurred in his own person; for after pretending to the power of extending human life to an indefinite limit, by virtue of his *elixir*, he died in 1541, at an inn at Saltzburg, in the forty-eighth year of his age, in consequence of an attack of fever, and was buried in the hospital of St. Sebastian, to which he bequeathed the little property that he possessed.

Notwithstanding the reputation, and the numerous eulogies bestowed on this singular man, it can scarcely be said, that either scientific chemistry or medicine is much indebted to him for its advancement. The fundamental doctrines of his chemistry, which resolved every thing into three elements, salt, sulphur, and mercury, and which were for a long time received, were, in fact, borrowed from his predecessor, Basil Valentine. And as to his medical skill, it consisted principally in the bold administration of some powerful remedies, which had been heretofore thought too dangerous to be used. His most favourite medicine was opium, a drug with which, it is obvious, he would be able in many instances to afford great and speedy relief; but with which also few permanent cures could be effected, and much mischief would necessarily be produced, when it was misapplied. Antimony and mercury were also medicines which he liberally prescribed, and he used various preparations of them of the most active kind. He was indeed one of the first to employ mercury for the cure of the venereal disease, and of course he must, in this severe and newly distinguished malady, have been successful in a degree, to which none of his contemporaries, who did not resort to that remedy, could attain: and this success was a source of considerable emolument. In fact, he must be allowed to have conferred a substantial benefit on mankind, by the introduction of mercury as a cure of this malady: and in this point consists his principal merit in respect to medicine. For his total ignorance of anatomy and rational physiology, his inability from want of literature to investigate the doctrines of the ancients, which he so boldly impugned, and his employment of a barbarous jargon, as well as his infatuated notions of magic, astrology, geomancy, and all the other branches of mythical imposture, are totally adverse to any claim on his part to the improvement of medical science; and indeed he appears to have been entirely destitute of clear and methodical views upon any subject. We shall not pretend therefore to enter into any detail of the unintelligible jargon and absurd hypotheses which he employed, or to enumerate the immense farrago of treatises, which made their appearance under his name after his death, the notices of which occupy above nine quarto pages in the Bibliotheca of Haller: for the first

first we are unable to comprehend, and the latter would be a waste of time. The most complete edition is that of Geneva, in three volumes folio, 1658. He published little while he lived. See Sennert. de Consensu et Dissensu Galenicorum, &c. cum Chymicis, cap. iv. De Paracelsi. Eloy Dist. Hist. de la Med. Gen. Biog.

PARACENTESIS, from *παρὰ* and *κέντησις*, to make a perforation, a term in Surgery, signifying the operation of tapping, or making an opening into the thorax, abdomen, or bladder, for the purpose of discharging the fluid confined in these parts in cases of empyema, hydrothorax, ascites, and retention of urine. Effused blood may also require an opening to be made into the chest. For an account of paracentesis thoracis, in different cases, we refer to EMPHYSEMA, EMPYEMA, EXTRAVASATION, HYDROTHORAX, and WOUNDS of the CHEST.

Paracentesis of the Abdomen, or Tapping — The belly is subject to two kinds of dropsy; one has received the name of *ascites*; the other is termed *empysemal*. In the first, the fluid is effused in the general cavity of the peritoneum; in the second, it is contained in a pouch, or cyst; whence the name of the disorder is derived. The first case is the most common, and affects indiscriminately both sexes; the second is more rare, and presents itself oftener in women than men.

The treatment of these two species of dropsy belongs to the physician; but when they have made considerable progress, they demand the aid of surgery, an operation of which may facilitate the action of the medicines exhibited, procure a degree of relief, which would be in vain expected from physic, and tend to prolong the life of the patient. The operations alluded to, are the puncture, or paracentesis, which consists in letting out the collected fluid, by piercing the abdomen with an instrument expressly constructed for the purpose, called a *trocar*.

In cases of ascites, the abdomen cannot be prudently or safely tapped, unless the quantity of water be considerable. By this observation, however, we are far from meaning to dissuade practitioners from deferring the operation as a last resource. On the contrary, we are decidedly advocates for the performance of paracentesis at an earlier period than it is usually done; and we would earnestly recommend the faculty to give their patients a better chance of recovery, by having them tapped before their constitutional strength is too much reduced. The operation is no hindrance to the trial and continuance of such medicines as are likely to prove beneficial. Hence, as soon as paracentesis can be done, without risk of injuring the viscera, or rather as soon as the abdomen is sufficiently distended with fluid to render the introduction of the trocar safe, the operation appears to be advisable.

There is much reason for believing that paracentesis would in numerous instances be something more than a palliative measure, if it were resorted to at an earlier period of the disease. Le Blanc, in his "Precis d'Operations," assures us, that he was constantly in the habit of practicing the operation immediately when he distinctly felt the fluctuation of the fluid in the abdomen, and that the success of the treatment was very great. Even in the ordinary mode of practice, the operation of paracentesis sometimes effects a radical cure, and the fluid never accumulates again. (See Journal de Médecine, tom. lxxvi.) It is highly probable, that this would be the case more frequently, if the operation were properly practised. (Fothergill in Med. Observations and Enquiries, vol. iv.) There appear to be two causes which tend to hinder the salutary effect of the ope-

ration. The first is, that if the disease recur after it has been once practised, all hope of radical cure is generally renounced. The second cause is, that the operation is almost always repeated too late, not until the belly is again prodigiously distended. But, in order to give the best chance of a radical cure, the operation should be repeated frequently and at short intervals. Dehaen used to tap dropical patients once a week, and in many cases, after he had performed the operation two or three times, the disease was stopped.

Even when the operation does not itself accomplish a radical cure of ascites, it at least promotes and facilitates this desirable event. There cannot exist a doubt, that it is impossible for the means, which the physician prescribes with a view of cure, to produce their free and full effect while the abdomen is distended with water, and the functions of the viscera thereby more or less disturbed. Experience has proved, that medicines, which were found to be ineffectual previously to the operation, have frequently had the desired effect after the water has been evacuated.

Serious and even fatal symptoms have sometimes followed the operation of paracentesis, and hence it has been considered by certain practitioners as a proceeding attended with danger. But the foregoing unpleasant consequences are not to be ascribed to the operation; but either to the physician, who has recommended it to be performed too late, or at an improper period, or else to the surgeon, who has executed it without the requisite skill and caution. For, how frequently it happens, that it is not undertaken until the abdomen is swelled with a prodigious quantity of water, and the patient is in an extreme state of disorder and debility, partly from the long duration and high degree of the disease, and partly from the effect of the large quantities of violent medicines which have been exhibited. The operation is here plainly unseasonable and too late. If the sudden discharge of the fluid should now give rise to alarming consequences, the occurrence would prove nothing more, than that the operation, like every other means, is not proper at every time, and under any circumstances. In such cases the right opportunity of doing it is past. It ought to have been resorted to at an earlier period. It is a certain fact, that the sooner dropical patients are tapped, the less dangerous and the more beneficial is the operation. Immediately when there is a sufficient quantity of fluid in the abdomen to produce a manifest fluctuation, paracentesis is practicable; and no sooner do medicines begin to debilitate the patient, or become ineffectual, than the operation is indicated as a measure which should not be deferred. But even in those very instances in which paracentesis has been improperly delayed, modern surgery is furnished with a method of obviating the perilous symptoms, which are liable to arise from the sudden evacuation of the large quantity of fluid, as we shall presently have occasion to explain.

The following are the ordinary symptoms of ascites. A smooth uniform swelling extending over the whole abdomen, but most prominent at that part which happens to be the most dependent. A shining or glossy appearance of the integuments, which is particularly observable in the early stage of the disorder, and becomes obvious when the complaint has attained a high degree, and the abdomen is exceedingly tense and distended. An œdematous swelling of the feet and scrotum, especially when the disease is making progress. Thirst, dry skin, costive bowels, and hardened stools; a scanty secretion of thick dark-coloured urine; difficulty of breathing, especially in the recumbent posture; and, lastly, the fluctuation of the fluid in the abdomen. The latter symptom can be distinctly felt by the surgeon, when he places the palm of one of his hands upon one side

PARACENTESIS.

of the patient's belly, and taps gently with two fingers upon the opposite side.

There is one case, which bears considerable resemblance to dropsy of the belly, and may easily lead a careless surgeon to commit a serious mistake. We here allude to a retention of urine, that has existed a considerable time, and has attained a very high degree. In this instance, the bladder is sometimes so enormously distended, that it produces an uniform swelling of the whole belly, attended with a fluctuation and protuberance at the most dependent part of the abdomen. As, in this case, the bladder has lost its power of contraction, it always remains full and distended; but while the pressure of the abdominal muscles and viscera resists a still greater expansion of this organ, it also occasions an evacuation of a certain quantity of urine every day. This circumstance prevents the retention from proving fatal, and is apt to lead the practitioner into the error of mistaking the case for dropsy.

The instrument with which the paracentesis of the abdomen is performed, is called a trocar, of which there are several kinds. The celebrated Richter thinks the common one the best. Most of the modern alterations, which have been made in the construction of trocars, have only tended, says he, to render the employment of these instruments more difficult. There is no reason for the ordinary objection, that the common trocar cannot be introduced without considerable force. If the part into which it is about to be passed be made tense, very little force will be necessary, especially if care be taken to rotate the instrument gently as well as push it forward. Hence, all the inventions, which have originated from this supposed imperfection, are, according to Richter, entirely useless. He represents the trocar with a double edged point as needles. The proposal of Mr. Cline, to make a puncture with a lancet first, and then to introduce into the opening a blunt-pointed trocar, is alleged to be superfluous. Nay, these innovations are stated to be worse than useless. A cutting instrument is liable to injure the blood-vessels, and bring on a weakening degree of hemorrhage; and it is said, that the wound, thus made, does not so readily heal as that made with a common trocar. That cutting edged instruments are attended with the inconvenience of being apt to wound enlarged veins, and produce a disagreeable degree of hemorrhage, is a truth, of which the writer of this article has recently met with a convincing example. A female, who had strong aversion to being tapped with a trocar, prevailed upon him to make the opening with a lancet. The puncture was made in the linea alba, about three inches below the navel. A stream of dark-coloured venous blood continued to run from the wound the whole time the water was flowing out of the cannula, and did not cease until a compress was applied. The quantity of blood lost could not be less than a pint, or a pint and a half. In many cases, the loss of so much blood would prove fatal to a dropical patient, and is a thing which one must always feel anxious to avoid.

It was the general plan, a few years ago, to introduce the trocar at the middle of a straight line drawn from the navel to the anterior superior spinous process of the os ilium, or at the central point of the space between the navel, the spine, the crilla of the ilium, and the lower false ribs, and the puncture was made on the left side, in order to run no risk of injuring the liver, in the event of this viscus happening to be enlarged. In operating in the first of these situations, the intention of the surgeon was to make an opening into the abdomen at the linea semilunaris. Modern practitioners usually prefer making the puncture in the linea

alba, for several weighty reasons. The first is, that in the old method, you are not sure of introducing the trocar in the exact situation of the linea semilunaris, and consequently may unnecessarily wound the thick muscular parietes of the abdomen, instead of merely a thin tendinous part. Another still more important objection is, that the epigastric artery has sometimes been wounded by very skilful men, even by professed anatomists, in the attempt to tap in the linea semilunaris. In dropical cases, the rectus muscle is frequently much broader than in a healthy subject; and as it always yields to the distention of the fluid in a greater proportion than the lateral layers of muscles, the above-mentioned measurement is very likely to cause the wound to be made near the course of the epigastric artery.

When the operation is to be performed in the linea alba, (and, except in cases of encysted dropsy, we would always recommend this mode,) the trocar should be introduced about three inches below the navel. As soon as the instrument meets with no farther resistance, it is not to be pushed more deeply, without any object, and with a possibility of injuring the viscera. The cannula alone is now to be conveyed a little further into the opening, at the same instant that the fillet is withdrawn, in order to allow the fluid to run out.

Notwithstanding the fluctuation of the water may be plainly felt at the part where the puncture is about to be made, the surgeon must refrain from being too bold with the trocar, lest he wound some of the viscera. A bowel may lie very near the peritoneum, when a manifest fluctuation is perceptible at the part, the intervention of a very small quantity of fluid sufficing to cause such a sensation to the fingers of an examiner. Caution, therefore, in this operation is a most prudent and necessary virtue.

Sometimes the surgeon feels a fluctuation over the whole abdomen, but in a weak and indistinct way. In this circumstance, when the patient is not at the same time affected with anasarca, which of course must tend to weaken the sensation of a fluctuation, the surgeon has reason for suspecting, either that the disease may be encysted dropsy, or that the fluid contained in the abdomen may be thick, or else that the tumour of the belly may be occasioned by hydatids.

In performing paracentesis, the practitioner should always be careful to avoid wounding the cutaneous vein, which, in dropical persons, frequently attain a vast size, and become capable of emitting a large quantity of blood.

In dropical patients, the navel swells in such a manner, that it puts on the appearance of a bladder of water. In this case, a proposal has been started to open the tumour of the navel with a lancet, taking care to make only a small aperture, so that the fluid may not be all discharged suddenly, but may be some days in dribbling away. It is said, that in performing paracentesis in this way, there is not only no bleeding, but no risk of any perilous symptoms, so gradually does the water make its escape. The alarming disposition, which often immediately arises from the sudden discharge of the fluid in the ordinary operation, is a source of considerable uneasiness both to the patient and the surgeon; and the avoidance of it is undoubtedly a desideratum of importance. Another advantage of the plan, which we have just now been speaking of, is, that the little opening does not directly close up, so that the continuance of the oozing from it prevents for some time any re-accumulation of fluid in the abdomen. The practitioner may the more readily make up his mind to this operation, by considering, that if a puncture be not made into the swelling of the navel, a spontaneous opening is in time generally produced; that

PARACENTESIS.

when this has happened, and the fluid been thus discharged, no bad consequences have ensued; and, lastly, that the method has been already practised with success. (See Sims's *Obf.* in the *Memoirs of the Medical Society*, vol. iii.) The apprehension of an umbilical hernia being the consequence, which Garengot and others entertained, is, as Mr. Samuel Sharp conjectured, quite unfounded, especially when the puncture is small, as it always ought to be. (Richter's *Anfangsgr. der Wundarzn.* Band 5, § 143.) Sometimes the water descends into the empty sac of a scrotal hernia, and distends it in a considerable degree. Here we may without hesitation adopt the plan of discharging the water from the cavity of the peritoneum, by puncturing the hernial sac. Frequently, in the female subject, the fluid of ascites presses upon the vagina in such a manner, as to produce a kind of prolapsus of the latter part, which has the appearance of a pouch filled with water. In a case of this description, the fluid has been evacuated from the abdomen, by puncturing the tumour of the vagina with a trocar, and the wound healed very favourably. Bishop on *Medical Communications*, vols. i, ii.

The plan of tapping males from the rectum, and women from the vagina, has been suggested as one deserving of general imitation. In 1788, Macarn, a surgeon at Turin, addressed a letter upon this subject to the secretary of the French Academy of Surgery, mentioning three examples, in which the operation had been done in the foregoing way, and requiring such further information as could be given him. Allan, a member of the academy, was the only one who knew any thing about the method. He recollected having, in 1767, presented to the society a memoir, in which he discussed the question, whether paracentesis from the bladder and rectum might not have advantages. (See Sabatier's *Médecine Opératoire*, tom. i. p. 173.) We join Richter in the opinion, that, as a general practice, this does not deserve recommendation, and that it should only be pursued, when nature indicates it, by presenting a tumour either in the vagina or rectum.

In the operation of paracentesis, it is prudent to employ an assistant in compressing both sides of the abdomen; by which means, the contained fluid will be urged in larger quantity towards the place where the trocar is to be introduced; the integuments will be rendered tense, so that the instrument will penetrate with greater ease; the determination of the water towards the part about to be punctured, will increase the distance between the peritoneum and the viscera of the abdomen; and, of course, the likelihood of these being touched with the point of the trocar will be diminished. As such compression should be maintained till the end of the operation, the assistant ought to put himself in a position, in which he will be able to do what is required of him without the least remission.

It is customary with many operators to oil the trocar, just before using it; and this plan has come into vogue from a supposition, that the instrument will now pierce the flesh with greater facility. For our own part, we have always regarded this fashion as equally useless and harmless: its omission is far more proper than that of many other circumstances, which are too frequently neglected. The patient is mostly tapped as he sits in a chair, or upon the edge of his bed. The surgeon is to hold the trocar in his right hand, in such a manner that the handle of the instrument is exactly in the hollow of the palm, while the fore-finger is applied along the cannula to within an inch and a half of the point of the trocar. The end of the finger prevents the instrument from piercing too far, which it would otherwise be apt to do in a very sudden way.

If it be a common round trocar that is used, its entrance will be greatly facilitated by rotating it a little, at the moment it is pushed forward. The sudden cessation of all resistance apprises the operator of the point of the instrument having passed through the peritoneum. The trocar, or stilet, is now to be immediately withdrawn, care being taken to keep back the cannula with the left thumb and fore-finger. Sometimes the fluid suddenly ceases to flow, which circumstance is generally owing to a part of the omentum, or intestines, having fallen against the inner opening of the cannula. In this case, the part causing the stoppage must be pushed back by means of a probe, passed through the tube. Frequently the obstruction is produced by membranous flakes, which the water sometimes contains: here the introduction of a probe will also remove the stoppage.

When most of the fluid has been discharged, the viscera often come directly into contact with the inner end of the cannula, which, if moved about, will bruise and injure the parts. Hence, towards the end of the operation, the tube should always be held entirely motionless. Although it is always proper to draw off as much of the water as possible, yet the practitioner must be careful not to press and handle the lower part of the abdomen too forcibly, with a view of squeezing out the whole of the fluid, lest he press the bowels against the cannula, and excite inflammatory symptoms.

Sometimes swooning, extreme prostration of strength, and violent pain, occur during and after the operation. These evils are imputed to the sudden evacuation of the water, the consequent sudden relaxation of the distended parts, and the copious influx of blood into the containing and contained parts of the abdomen from the rest of the circulation. Experience has proved, that this alleged cause of the indisposition and even danger, which are apt to take place upon the discharge of the water, is founded in reality. A patient died during the operation: upon examination of the body, all the vessels of the brain were found quite empty, while those of the abdomen were turgid with blood. (Richter's *Anfangsgr.* Band 5, p. 147.) Several plans have been suggested, with the view of preventing the dangerous consequences under consideration. Some writers advise us not to let out all the fluid at once; but, after discharging only a part of it, to stop up the cannula secure in its place, and let out a certain quantity of the water every day. There is too great reason to apprehend, however, that the cannula, being a hard extraneous body, if left long in the wound, with a portion of it in the abdomen, would rub against and irritate the bowels, so as to excite inflammation, and other dangerous effects, especially when the quantity of fluid in the cavity of the peritoneum has been reduced to a small quantity. Others have recommended a repetition of the operation from time to time, and discharging on each occasion only a part of the fluid. The objections which have been urged against this plan are, that the water, which is left after the first performance of paracentesis, would ooze through the puncture, so as to prevent it from healing; and that if the operation were to be repeated a certain number of times, the quantity of fluid would be so small, that the abdomen could not be again punctured, without risk of the intestines being wounded by the trocar.

The means, commonly resorted to for the prevention of the bad symptoms apt to be produced by the operation, is making pressure with a bandage, or towel, applied round the body, as soon as the fluid has been discharged. The method seems, indeed, to be a rational one, and well calculated to answer the end proposed; but, unfortunately, if

PARACENTESIS.

it be not adopted till after the fluid has been let out, it is not likely to be of much service. After the water has been discharged, the bad symptoms have in general already come on. It was observed by Bertrandi, that a patient became faint in the operation every time the assistant remitted the pressure of his hands on the abdomen; a fact which proves, in Richter's opinion, that, in proportion as the parts cease to be compressed by the evacuation of the water, the blood is determined into them.

The celebrated Dr. Alexander Monro was the inventor of a sort of belt, for making the necessary pressure on the abdomen, during the operation of paracentesis; and it is certainly well adapted to the purpose. It is furnished with straps and buckles, which are fastened behind the patient; while in front it is provided with an aperture at the place where the trocar is to pass. It is applied before the operation, and, in proportion as the water escapes, the straps are drawn more and more tightly; so that when the whole of the fluid has been let out, the abdominal viscera are just as much compressed as they were before the performance of the operation. This belt, being applied previously to the puncture, the water is more particularly urged towards that point which is left uncompressed, namely, the place where the opening in the bandage is situated, and where the surgeon means to introduce the trocar. Here the integuments become prominent and tense, so that the instrument penetrates more easily, and without risk of injuring any of the internal parts. When Monro's belt or girdle is not at hand, a very good way of keeping up the requisite pressure, during the operation, is by means of a sheet, which is to be put round the abdomen, and to be gradually tightened by the assistants, in proportion as the fluid escapes. Immediately after the water has been discharged, a piece of lint and the emplastrum saponis are to be applied to the wound; a flannel compress, sprinkled with camphorated spirit or brandy, is to be laid over the abdomen; and a tight flannel roller put round the body. The patient is to be got into bed as quickly as possible, and may take the following draught: \mathcal{R} Ammoniz Muriat. gr. x. Mist. Camph. ζ iss Tinct. Opii \mathcal{M} xxx ft. haust.

In operating at the middle of the fore part of the abdomen, that is, at the linea alba, the surgeon cannot wound any artery of magnitude; though it is possible for him even here to have hemorrhage from a varicose enlarged vein, should he happen to wound such a vessel. The writer of this article, as already related, had a patient, who lost a very large quantity of blood, after being tapped in the linea alba with a lancet. But the most perilous kind of bleeding is that which proceeds from a wound of the epigastric artery, and which must ever be regarded as a serious objection to tapping at the side of the abdomen; because, in this method, no surgeon can be sure of not producing it. As the epigastric artery lies deeply, the blood may become extravasated in the abdomen, and the patient die of the consequences, without any continuance of external hemorrhage from the wound. When the wound bleeds profusely, the preceding artery having been injured, surgical authors advise us to introduce into the opening a cylinder of wax, of sufficient diameter to fill up completely the track of the trocar. Bellecq, a French surgeon, first adopted this plan with success; but in withdrawing the wax, after it had answered its purpose, it broke, and the part of it left behind did not come away till some time afterwards. Hence this practitioner was led to give the preference to the employment of a piece of a narrow wax-candle, the wick of which would render the whole stronger, and more certain of being drawn out again entire. Sabatier very properly thinks a piece of

a thick bougie might be still better. (Sabatier, Médecine Opératoire, tom. i. p. 178.) Thus far we have been speaking of paracentesis, as performed in cases of ascites: it is next proper to say a few words on the subject of encysted dropsies, and describe the mode of operating for them.

Sometimes the fluid is not contained in the cavity of the peritoneum itself, but in a preternatural cystus, the disease being then termed encysted dropsy. Various parts in the abdomen may be the seat of this disorder. The left lobe of the liver has been found distended into a sort of pouch, that was filled with an aqueous fluid. It is more common, however, for the omentum to be affected; but the ovaries and the cellular substance of the peritoneum are the parts, in which the disease takes place the most frequently of all.

Dropsy of the ovary makes its appearance first as a circumscribed moveable swelling on one side of the abdomen, and, in the beginning, is not uncommonly supposed to be a solid tumour. In general, the swelling enlarges very slowly, and the patient suffers no particular inconveniences from it. At length, however, it undergoes a rapid increase of size, and distends equally every part of the belly, so that it may now be easily mistaken for an ordinary case of ascites. Dropsy of the ovary may be discriminated from the latter disease, by paying attention to the following circumstances. Both in the early and more advanced stage, the feel of a fluctuation is never so plain as in ascites. Sometimes the fluid is contained in a large number of cysts, which have no communication with each other; and sometimes it is very thick and viscid; in which circumstances, scarcely any fluctuation at all is usually distinguishable. In particular instances, even when the whole abdomen appears, on a cursory view, to be every where uniformly distended, the prominences and inequalities caused by the separate cysts may be felt on more careful examination. The swelling of the abdomen hardly ever sinks downward to the most depending part, as it does in ascites. The urine is generally secreted in the ordinary quantity, and is of a natural quality. Even when the tumour has attained considerable magnitude, the patient has fewer complaints than in common dropsy; she breathes more freely, moves about easily, looks better, and is less troubled with thirst. In numerous instances, the patient suffers no inconveniences whatsoever, excepting such as are directly produced by the size and weight of the swelling. The menses of many patients are also quite regular, notwithstanding the disease is advanced. The navel never swells, as it occasionally does in ascites.

But although these are the usual symptoms of encysted dropsy, the disease is subject to several varieties, which sometimes facilitate the diagnosis, sometimes render it more difficult. For example, in certain cases, the fluctuation is as plain as in ascites. In others, the urine is thick, and secreted only in small quantities, and the feet swell, as is common in this latter disease. The swelling may increase with great rapidity, or it may only enlarge from time to time, and at length remain a good while stationary. Sometimes, as the disorder advances, pains occur in the cyst, and the patient is afflicted with colic, constipation, fever with emaciation, &c.

The fluid found in a dropsical ovary is never of a bright yellow colour, and transparent, as the water of ascites commonly is; but is always more or less discoloured, fetid, and blended with matter, blood, or a thick sediment. When, therefore, the exact nature of the case is not known before the operation is done, it is always ascertained then by the quality of the discharged fluid. Sometimes the fluid contained in the ovary is of a gelatinous kind. In other instances, this viscus is found filled with hydatids. In most

PARACENTESIS.

cases, the ovary is at the same time in a scirrhus state, and the inner surface of the cavity which it forms is ulcerated. Numerous patients live a considerable time with this disease. Twenty and even thirty years have been known to elapse, ere the disorder proved fatal.

Dropsy of the ovary is mostly observed to afflict women who have either had many children, or repeated abortions. It is generally incurable. Internal means avail little; the operation by which the fluid is let out is the only useful proceeding, and even this procures merely temporary relief, for, in general, the sac soon becomes filled with fluid again. Sometimes, indeed, the operation proves hurtful, and hastens the patient's dissolution. In the first performance of it, a clear fluid is usually discharged; but when it is repeated, the water is turbid, and mixed with blood and matter. The more frequently the operation is done, the more quickly does the water continue to accumulate again. Paracentesis seems not only to promote the ulceration of the cyst, but also to lower the patient, and bring her to the grave sooner than she would otherwise have arrived at it. Certain it is, at all events, that numerous patients, who have not been operated upon, have lived a long while with disease, while reiterated operations have in general been soon followed by a fatal termination.

Hence, when the swelling is not very large, and not productive of great inconvenience, we are advised by Richter to refrain from every means, and from the operation itself. He acknowledges, however, that there are cases where the operation may be judiciously and advantageously practised; namely, when the swelling is exceedingly large, and attended with much inconvenience. That it may be usefully done in certain instances, seems to be proved by examples, in which it was repeated forty-one times, (Medical Communications, vol. ii.), sixty-five times (Mead), and even 155 times (Philos. Transact. vol. lxxix.)

When it is known beforehand, that the disease is an encysted dropsy, one should choose rather a large trocar, because the fluid is usually thick, flaky, and viscous, and will not readily flow out through a narrow cannula. The place for making the puncture is not so determinate as in cases of ascites. The trocar is to be introduced where the tumour is not prominent, where the fluctuation is most distinct, where there is no obvious induration, and where there is no risk of wounding the epigastric artery. Dropsical enlarged ovaries are generally adherent to the peritoneum; but when they are not so, the performance of the operation may not be followed by any bad effects. Sometimes, both the ovaries are at the same time distended with fluid. In this case, after an ovary has been tapped, the operation may be practised on the other. When the water is contained in several different cysts, it is sometimes necessary to make no less than four or five punctures, in order to discharge a sufficient quantity of the fluid. In particular examples the fluid is so gelatinous, that it will not pass through the cannula, and, in this circumstance, it has been usual to dilate the puncture by an incision, so as to let out the contents of the swelling; but the cases have commonly had a fatal termination. Richter decidedly recommends us not to imitate the practice, but to withdraw the cannula, and abandon all thoughts of evacuating the fluid.

Since the discharge of the water, by means of a trocar, as in ascites, only palliates the disease for a short time, the question has been started whether any thing can be done with a view of effecting a radical cure? With this design, several plans have been suggested, the merit or demerit of which can only be determined by future and repeated experience. Le Dran has advised us to make an incision into the swelling,

so as to let the fluid which is daily secreted into the sac, have constantly a ready issue, and to keep the diseased cavity continually empty, in order that it may have an opportunity of contracting. (See Mem. de l'Acad. de Chirurgie, tom. vi.) The operation is done in two ways; viz. either a trocar is first introduced, and, after the water has been let out, and a director has been passed in through the cannula, the latter is taken away, and an incision four inches long made on the director; or else a trocar with a cannula having a fissure in it, is employed, through which fissure the puncture is enlarged with a bistoury.

After the operation, emollient injections are to be employed until the matter is of good quality, and then an attempt must be made to promote the closure of the aperture with injections of an astringent nature. Le Dran assures us, that such an operation has been actually practised with success. In cases where the cavity of the ovary is divided into several cysts, or where it is filled with a gelatinous fluid, or hydatids, and where, consequently, the palliative method is inapplicable, this operation is the only practicable undertaking.

There are so many things to be taken into consideration, however, that the surgeon will hardly be inclined to adopt such practice in ordinary cases. The uncertainty whether the ovary is adherent to the peritoneum, is often an unpleasant circumstance. A dropsical ovary is also commonly in a scirrhus state, a thing that must render the radical cure difficult, and even impossible. Before attempting it, we are advised by Le Dran always to let out the water with a trocar, and then examine whether any scirrhus induration can be felt, and, if it be perceptible, not to think of undertaking the radical cure. Le Dran also assures us, that scirrhus swellings, which may sometimes be felt at first, frequently subside during the continuance of the suppuration. This desirable event Richter thinks cannot be expected to happen often, and he apprehends that after the water has been discharged, the indurated part of the ovary will not always admit of being felt. The strongest argument against this operation, however, arises from the ill success which has hitherto attended it. In general, the suppuration soon afterwards becomes more copious and degenerated, and the patient dies of a lingering fever, at an earlier period than she would probably have done, had the operation not been done at all. In one example, Le Dran converted the wound into a fistula, by which means the patient lived a long while in a very tolerable condition.

Other practitioners, fearful of the free entrance of the air into a large incision, have suggested the plan of letting out the water with a trocar, and then introducing through the cannula a flexible hollow bougie, which is to be kept in the opening, until either a complete cure, or a fistula is produced.

Richter represents this operation as attended with several advantages, and no hazard. It has always been observed, that patients who have submitted to the palliative operation, always find themselves very well, until the fluid has accumulated again in considerable quantity. This last radical operation has at least the advantage, that while it keeps the sac empty, it also keeps the patient in the same tranquil state as is generally enjoyed for some days after the palliative method. When an incision has been made, it generally heals up again very soon, so that it becomes necessary to introduce a cannula. Thus, even supposing a large opening were useful, it is only of short duration. A few days after an incision has been made, the patient is in the same state as if a mere puncture had been practised, and a necessity arises for dilating the wound to its original size. We have noticed, that

PARACENTESIS.

that the incision has been known to change into a fistula, with which the patient survived a long while with tolerable health. By means of the puncture and flexible tube, an artificial fistula is immediately made. There is also only this difference between the incision and the puncture, that by the latter, the patient is at once placed in a state, in which experience proves that she mostly finds herself well, and capable of living a considerable time. On the contrary, the operation by incision always puts the patient's life at first into imminent danger.

There can be no doubt that paracentesis, and the employment of a flexible tube, will be more likely to prove successful the sooner they are tried. Experience shews, that the more frequently the water is drawn off by the palliative operation, the more blended with matter, the more bloody, and the more turbid it becomes, and the more rapidly it collects again. It appears also, that the repeated emptying and filling of the cyst again, always render the patient's condition worse, and promote ulceration within the dropsical cavity. A flexible tube should always be introduced directly after the first palliative operation, so as never to suffer the cyst to be filled again. The more the cyst is dilated before it is the first time punctured, the more likely is it to be in a morbid state, and the more improbable is the attempt at a radical cure to succeed: the water, therefore, should always be discharged as early as possible, and a flexible tube be immediately introduced. By observing this rule, we may rationally expect to accomplish in many instances a radical cure, and, when this success does not attend the plan, we may rest certain that the state of the patient will at all events be meliorated, and her life prolonged. During the first few days, the operation is occasionally followed by vomiting, fever, &c. which symptoms, however, are commonly unattended with danger, and soon give way to proper treatment. Richter's *Anfangsgrunde*, &c. band 5, kap. 6.

Some practitioners have recommended repeating the palliative operation from time to time, with a view of effecting a radical cure. Unfortunately, however, the cyst of a dropsical ovary cannot, in general, be safely tapped until considerably distended, and hence the plan does not promise much success; but in those kinds of encysted dropsy which lie more superficially, the method may answer better.

The encysted dropsy of the peritoneum is commonly seated in the cellular substance, between this membrane and the peritoneum. Here the cyst, which contains the fluid, is formed of condensed cellular substance. The prognosis must evidently be more favourable than in dropsy of the ovary. The surgeon detects the existence of the disease at an earlier period, and with greater facility, while the things to be considered, and the dangers to be feared in the treatment, are much fewer, and the hope of a radical cure far stronger than in a dropsical affection of the ovary. The cyst may be formed at any point of the circumference of the abdomen. Sometimes several cysts present themselves at the same time, forming at first so many separate tumours, which, as they enlarge, at length make one general swelling, in which, however, some irregularities may always be distinguished. The appearances and gradual changes of this sort of encysted dropsy resemble those which accompany dropsy of the ovary, with the exception of such symptoms as depend upon the different situations of the two diseases. When the cyst is situated at the lower and anterior part of the abdomen, the case may at first be easily mistaken for pregnancy; but a little attention to the different circumstances which characterise encysted dropsy and pregnancy, will soon dispel the error. In this kind of dropsy, a fluctuation may in general be more plainly felt, than in dropsy of the ovary. The sac is sometimes filled

with hydatids, and the disease is most frequent in women who have had many children.

As the swelling is soon obvious, and lies under the integuments and muscles, the palliative operation may be safely undertaken at a very early period, and be repeated when the cyst becomes at all prominent again. Here there is no possibility of an extravasation in the abdomen, nor of any of the viscera being wounded. A radical cure is frequently effected, as the case is not complicated with any scirrhus induration, and the attempt may be made early, before the cyst is of large size. The best mode of performing the operation is as follows: a puncture is first to be made, and a flexible tube introduced, which is to be kept in until the cavity of the cyst is as much contracted as possible; the wound is then to be dilated, and the cavity allowed to suppurate and fill up by the granulating process. Sometimes a fistula will after all remain, but it is attended with still less inconvenience than such a consequence usually is in cases of dropsical ovaries. See Richter's *Anfangsgrunde der Wundarzneeykunst*, band 5, kap. 6.

Paracentesis of the Bladder.—This operation becomes indispensable, when the symptoms of a retention of urine are urgent, and this fluid cannot be voided through the natural channel so soon as the circumstances of the case absolutely require. The operation is proper also, only where all other means of promoting the evacuation of the urine have failed, and where there is reason to hope that the natural passage for this secretion will be in a moderate length of time re-established: for it is to be regarded merely as a palliative measure. Such a case is not very frequent. The operation itself is not the occasion of much danger, and the chief peril mostly arises from the puncture having been too long deferred.

Although, however, it appears to us, that the operation of puncturing the bladder ought not to be long postponed, after milder methods have decidedly failed, we believe that these methods will almost always prove successful under skilful hands, and that the operation may generally be avoided. In the opinion of Default, there are very few instances in which a surgeon, expert at introducing the catheter, cannot pass this instrument into the bladder, and consequently the cases in which paracentesis is absolutely necessary, must be exceedingly unfrequent. This assertion, says Bichat, might be confirmed by a multitude of cases. During the years of the time when Default was principal surgeon of the Hôtel-Dieu at Paris, where diseases of the urinary passages, and more especially obstructions of the urethra, are constantly numerous, this distinguished practitioner never had occasion to puncture the bladder, except in one example. This case happened soon after his appointment to the hospital, and he used to declare, subsequently, that if he had then had as much experience, and had possessed as much skill in introducing the catheter as he had afterwards acquired, he might, perhaps, have extricated this individual patient from the necessity of submitting to the operation. But, as Bichat observes, since it is not every practitioner that is skilful enough to make the catheter surmount the various obstacles which may present themselves to its passage, without risk of producing a false passage, or doing other serious mischief; and since the urethra may sometimes be totally obstructed, so that no catheter nor bougie, though introduced as far as the stoppage, can serve to give exit to the urine; the operation, in these circumstances, becomes positively indispensable, for the purpose of relieving the urgent symptoms arising from the retention, and in order to prevent the bladder from bursting. *Cœuvres Chirurg. de Default*, par Bichat, tom. iii. p. 316.

PARACENTESIS.

The circumstances in which puncturing the bladder becomes necessary and proper, will be hereafter noticed again. See URINE, *Retention of*.

There are three situations in which the surgeon may tap the bladder; *viz.* from the perineum; above the os pubis; and from the rectum. As the first mode of operating is nearly exploded, and has nothing to make it preferable to the two others, we shall omit a description of it in this work.

Paracentesis of the Bladder above the Pubes.—There are some practitioners who prefer making a perpendicular incision, about two inches in length, through the integuments and fat, covering the lower part of the linea alba. When this plan is followed, the wound ought not to be made, as some authors direct, with its lowest part full an inch above the os pubis. There is no great reason for keeping so far from this bone, and the lower the incision is made, the nearer it is to that part of the bladder which is the most desirable to puncture, and the further it is from the peritoneum. Hence, the lower angle of the incision should nearly meet the upper part of the symphysis pubis. A cut of the same length is next to be made between the pyramidal muscles, and, this being done, the surgeon will be able to feel with his finger the prominent distended bladder. A trocar, the curvature of which forms the segment of a circle seven inches in diameter, is now to be introduced into the exposed part of this viscus. When this instrument is held with its convexity upward, that is, towards the patient's navel, it can be more conveniently introduced obliquely downward, and backward, into the bladder, in the direction of the axis of this organ, than any straight trocar can possibly be set. M. Sabatier observes, a curved instrument of this kind is also much less likely to penetrate the back part of the bladder and wound the rectum, besides having this advantage, that when the urine is discharged, and the bladder collapsed, the cannula will not be so apt, as that of a straight trocar, to slip out of the part into which it has been introduced. *De la Médecine Opératoire*, tom. ii. p. 128, 129.

However, there can be no doubt, that when the bladder is certainly distended with urine, and the swelling distinct and prominent, it is perfectly safe to introduce the trocar at once into the bladder, without any preliminary division of the integuments, fat, &c.

When the operator perceives, by the want of resistance, that the point of the instrument is in the bladder, he is to take hold of the mouth of the cannula, and while he pushes the tube further inward, he is to withdraw the stylet. The cannula is to be allowed to remain in the wound after the urine is evacuated. Its mouth may be closed with any kind of stopper, which cannot insinuate itself into the bladder, and it may be kept from slipping out by means of two pieces of tape, which are to be passed through the two little rings at the sides of the instrument.

There are surgeons who recommend an elastic gum catheter to be passed into the bladder through the cannula, and then taking the latter away. The advantage of this practice is not at all obvious, and, as for ourselves, we are positively adverse to the practice. An elastic gum catheter does not fill the wound; consequently, the urine is discharged, not only through the tube, but also between the sides of the wound and the circumference of the instrument, so that the chance of the urine becoming diffused into the cellular membrane is not guarded against, as it is by allowing the cannula to remain in the wound, at least two or three days, until the inflammation has closed the interstices of the surrounding cellular substance, and removed

the possibility of the urine becoming extravasated. It is now known, that, after the above period, the cannula may be safely taken out, and easily introduced as occasion may require.

Another objection to introducing an elastic gum catheter is the length of such an instrument, the end of which would produce irritation in the bladder. The use of long, straight silver cannulae has been known to form a communication between the bladder and rectum, in consequence of ulceration, or sloughing, produced by the pressure of the points of these instruments on the back part of the bladder. Mr. Samuel Sharp mentions his having seen this accident. *Critical Enquiry*, &c. p. 127, edit. 4.

It is obvious, that the outlet made for the urine by the operation of paracentesis, is merely designed as a temporary one, and that as soon as the impediment to the passage of the urine through the urethra is removed, the wound ought to be allowed to heal.

Whenever the prostate gland is known to be very much enlarged, one would certainly prefer this mode of operating to puncturing the bladder through the rectum. The wound is made in a situation where there is no risk of injuring any part of importance; but, in this method, little as the chance may be of an extravasation of urine taking place, it is undoubtedly a possible event, and the opening is not made in a depending place, so that the whole of the urine cannot very well be voided through it.

Paracentesis of the Bladder from the Rectum.—The patient is to be put in the posture which is usually chosen for the lateral operation for the stone. (See LITHOTOMY.) An assistant is to make pressure on the abdomen, just above the os pubis, in order to make the prominence of the bladder plainer to the surgeon's finger in the rectum. A curved trocar, with its point drawn within the cannula, is to be introduced with the right hand, and conveyed upon the left fore-finger, as high as the surgeon can reach up the intestine, along the swelling formed by the distended bladder. The instrument should be kept exactly in the central line of the front portion of the rectum, and, when conveyed sufficiently beyond the prostate gland, the point of the trocar is to be pushed into the bladder, through the interior part of the intestine.

This operation is so easy and safe, that it must be allowed to merit a general preference. The coats of the rectum and bladder are here almost in immediate contact, and the instrument has to penetrate no thickness of substance. The operation is not more painful than venesection, and the distended bladder is so distinctly perceptible to the finger, that no mistake can well be made. The only chance of doing mischief arises from the situation of the vesiculæ feminales; but all risk may be avoided, by introducing the finger very high up the rectum, and making the puncture exactly in the central part of the swelling. The trocar must, of course, be of a length sufficient to admit of the operation being done according to these principles.

The only inconvenience following the operation, is the necessity of keeping the cannula introduced through the anus until the urine resumes its natural course. This circumstance is not only very troublesome when the patient is walking, or sitting down, but is particularly incommode when he goes to stool. The difficulty of voiding hardened feces, however, while the instrument is introduced, may always be obviated by injecting a clyster. Whenever the patient has a motion, it is, of course, necessary for him to hold the cannula with his fingers, or else it would be protruded.

We have no facts on record, however, which justify the conclusion,

conclusion, that any serious harm would result from withdrawing the cannula immediately after paracentesis of the bladder from the rectum. If the urethra were not pervious at the time, the frequent passage of the urine through the puncture would probably be sufficient to keep it from becoming closed, and the occasional passage of this fluid, through the lower part of the rectum, would be far less annoying, than the continual presence of the cannula. There is one instance in which the cannula was inadvertently withdrawn forty-eight hours after the operation, and could not be introduced again. The urine was discharged into the rectum, through the puncture, for six days afterwards, and, as soon as it began to pass out through the urethra, the wound healed, without leaving any filulous communication between the bladder and the intestine. (Bentley in Med. Communications, vol. i.) Richter, indeed, assures us, that the cannula has even been taken out immediately after the operation without any ill consequences. (Anfangsgr. &c. band 6 p. 328.) Women seldom require the performance of paracentesis of the bladder. Retroversio uteri, however, is one case, which may render such proceeding absolutely necessary. The operation may be done in two ways, viz. from the vagina, and above the pubes. See Sabatier's Médecine Opératoire, tom. ii. Sharp's Critical Enquiry, &c. Richter's Anfangsgrunde, &c. band 6. First Lines of the Practice of Surgery, by Samuel Cooper, edit. 3. &c. &c.

PARACENTRIC MOTION, in *Astronomy*, a term used for so much as a revolving planet approaches nearer to, or recedes farther from, the sun, or centre of attraction.

Thus, if a planet in A, (*Plate XVIII. Astronomy, fig. 2.*) move to B, then SB — SA = bB, is the paracentric motion of that planet.

PARACENTRIC Solicitation of Gravity amounts to the same with the *vis centripeta*; and in astronomy, is expressed by the line AL, (*Plate XVIII. fig. 3.*) drawn from the point A parallel to the ray SB (infinitely nearer SA) till it intersects the tangent BL.

PARACHO, in *Geography*, a town of Hindoostan, in the cirçar of Gohud; 15 miles N. of Narwa.

PARACHUETEAS, a town of West Florida, near the Apalachicola. N. lat. 31° 24'. W. long. 85°.

PARACHURECOLL, a town of Hindoostan, in Marwar; 7 miles N.W. of Tripatore.

PARACHUTE, a machine in the form of an umbrella, sometimes annexed to a balloon, and sometimes used separately, and serving to buoy up a heavy body in its ascent, or to prevent its precipitate fall (as its name imports) in the atmosphere. (See *AEROSTATION*). Umbrellas have been used for this purpose from remote times in various parts of the East Indies. In the "Historical Relation of the Kingdom of Siam," by M. de la Loubere, who visited that country in the years 1687 and 1688, we have an account of the manner in which umbrellas were employed in the diversions of the court of Siam. "There died one," says this writer, "some years since, who leaped from a hoop, supporting himself only by two umbrellas, the hands of which were firmly fixed to his girdle: the wind carried him accidentally sometimes to the ground, sometimes to trees or houses, and sometimes into the river. He so exceedingly diverted the king of Siam, that this prince had made him a great lord, he had lodged him in the palace, and had given him a great title, or, as they say, a great name." See *UMBRELLA*.

PARACLET, a name which the church has given to the

Holy Spirit; from the Greek Παράκλησις, q. d. *comforter*, or *advocate*.

PARACME, Παράκμη, a Greek word signifying *declension*, or a thing's being past its height.

PARACOPE, or **PARACRUSIS**, a word used by Hippocrates to express a slight delirium in fevers.

PARACUSIS, from Παράκουσις, *non recte audio*, signifies, in the language of the nosologists, *depraved hearing*. The term is not applied to simple deafness, that is, to a mere diminution or abolition of the sense of hearing; but to those varieties of imperfect hearing, in which all sounds are heard incorrectly; as for instance, with hissing, ringing, or other noises; and to over-acute as well as obtuse powers of hearing. See Cullen, *Nofol. Meth. Gen.* 97.

PARACYNANCHE. See *CYNANCHE*.

PARADANGA, in *Geography*, a town of Bengal; 25 miles E.N.E. of Rungpour.

PARADE, the show, or exposure of any thing to view, in all its advantages and ornaments.

Bed of parade, is that in which a person lies in state.

PARADE, in *War*, a place where troops assemble, or draw together, in order to exercise or go on any service.

PARADE is more properly the appearance of the officers and soldiery at a post assigned them, to put themselves under arms, in the best order they can; either to mount, or break up the guard, or to form a battalion, or on some other occasion.

PARADE, in *Fencing*, is the action of parrying or turning off any push or stroke.

There are as many kinds of parades, as of strokes and attacks; as the parade inward, outward, above, below, feigned, &c.

PARADE is used in France for a species of farce, which was merely designed to amuse, and to excite mirth.

PARADE de Bouro, in *Geography*, a town of Portugal, in the province of Entre Duero e Minho; 16 miles N.N.E. of Braga.

PARADELLA, a town of Portugal, in the province of Beira; 12 miles S.E. of Lamego.

PARADES, a town of Spain, in the province of Seville; 5 miles S. of Carmona.

PARADIAZEUXIS, near a disjunction, was in the ancient Greek music, according to Bucehnius Senior, the interval only of a tone between the strings of the two tetrachords; such is the disjunction, for instance, which occurs between the tetrachord *fynemenon*, and the tetrachord *diezeugmenon*. See these several words.

PARADIES, DOMENICO, in *Biography*, a Neapolitan, arrived in England in 1742, at the beginning of lord Middlesex's opera regency. In 1747 he set "Fetonte," or Phaeton, for the theatre in the Haymarket. The drama was written by Vaneschi, afterwards manager of that theatre. In examining the airs of this opera, as set by Paradies, that were printed, the first seems very common and ill-phrased, nor is there much *glro*, or grace, in any of his songs that we have seen. Indeed he seems to have had no great experience as an opera composer. And during his residence in England he acquired more reputation by the lessons he published for the harpsichord, and the scholars he made on that instrument, for which he was an admirable master, than by his vocal compositions. His little scholar, Frederica, afterwards Mrs. Wynne, gained him so much reputation as a harpsichord master, that he was appointed to instruct the young princesses at Leicester-House; and had soon the offer of more scholars elsewhere than he could undertake.

His book of 12 lessons has great merit: steering between

tween Scarlatti and Alberti, and adding many new passages of brilliant execution, strung together in a mallyerly manner; yet they seem detached, and to form no style, or unity of melody.

PARADIGM, PARADIGMA, formed from *παράδειγμα*, *exemplar*, of *παρά*, and *δεικνυμι*, *ostendo*, q. d. *justa ostendo*, an example, or instance, of something said or done. See EXAMPLE.

Grammarians have appropriated the word paradigm to examples of declension and conjugations, which may serve as models for other words of the like kind.

PARADIGRAMMATICE, is used by some for the art of making all sorts of figures in plaiter. The artists in this are called *gyfsochi*.

PARADIN, WILLIAM, in *Biography*, an industrious French author, who flourished in the 16th century, but of whose personal history little more is known than that he was living about the year 1581. His most important works were "The Chronicle of Savoy," divided into two parts: the first part treats of the counts, and the second of the dukes of that country: "Aristeus's History of the Sepuagint:" "History of his own Times:" "Memoirs of the City of Lyons."

PARADIS, *Mademoiselle* THERESA, a young person, equally distinguished by her talents and misfortunes, was the daughter of M. Paradis, secretary to his imperial majesty, in the Bohemian department, and god-daughter to the late empress queen.

At the age of two years and eight months, she was suddenly deprived of sight by a paralytic stroke, or palsy in the optic nerves.

At seven years old, she began to listen with great attention to the music she heard in the church, which suggested to her parents the idea of having her taught to play on the piano forte, and, soon after, to sing. In three or four years' time she was able to accompany herself on the organ in the "Stabat mater" of Pergolesi, of which she sung the first *soprano*, or upper part, in the church of St. Augustin, at Vienna, in the presence of the late empress queen; who was so touched with her performance and misfortune, that she settled a pension on her for life.

After learning of several masters at Vienna, she pursued her musical studies under the care of Kozeluch, who has composed many admirable lessons and concertos on purpose for her use, which she played with the utmost neatness and expression.

At the age of thirteen she was placed under the care of the celebrated empyric, Dr. Mesmer, who undertook to cure every species of disease by animal magnetism. He called her disorder a perfect *gutta serena*, and pretended, after she had been placed in his house as a boarder for several months, that she was perfectly cured; yet refusing to let her parents take her away, or even visit her, after some time, till, by the advice of the barons Stoërk and Wenzel, Dr. Ingenhous, professor Barth the celebrated anatomist, and the express order of her late imperial majesty, she was taken out of his hands by force; when it was found that she could see no more than when she was first admitted as Mesmer's patient. However, he had the diabolical malignity to assert that she could see very well, and only pretended blindness, to preserve the pension granted to her by the empress queen; and since the decease of this princess, the pension of Mad. Paris was withdrawn, indiscriminately, with all other pensions granted by her imperial majesty.

Mad. Paradis quitted Vienna, in order to travel, accompanied by her mother, who treated her with ex-

treme tenderness, and was a very amiable and interesting character. After visiting the principal courts and cities of Germany, where her talents and misfortunes procured her great attention and patronage, she arrived at Paris, and remained there five or six months, and received every possible mark of approbation and regard in that capital, both for her musical abilities, and innocent and engaging disposition.

When she arrived in England, she brought letters from persons of the first rank to her majesty, the prince of Wales, the imperial minister, count Kageneck, lord Stormont, and other powerful patrons, as well as to the principal musical professors in London. Messrs. Cramer, Abel, Salomon, and other eminent German musicians, interested themselves very much in her welfare; not only as their countrywoman, bereaved of sight, but as an admirable performer.

She went to Windsor, to present her letters to the queen, and had the honour of playing there to their majesties, who were extremely satisfied with her performance, and treated her with that condescension and kindness, which all who are so happy as to be admitted into the presence of our gracious sovereigns, in women's of domestic privacy, experience, even when less intitled to it by merit and misfortunes than Mad. Paradis. Her majesty was not only graciously pleased to promise to patronize and hear her frequently again in the course of the winter, but to afford her all the protection in her power; as did his royal highness the prince of Wales, to whom she since performed, at a grand concert at Carlton house, to the entire satisfaction and wonder of all who heard her.

Besides her musical talents, which were indisputable for neatness, precision, and expression, particularly in the great variety of admirable pieces she executed of her maller, Kozeluch, Mad. Paradis was extremely well educated, and was very ingenious and accomplished; as she was able, with printing types, to express her thoughts on paper, almost as quick as if she could write. She understood geography, by means of maps prepared for her use, in which she could find and point out any province, or remarkable city in the world; and was likewise able, by means of tables formed in the manner of draught-boards, to calculate, with ease and rapidity, any sums or numbers in the first five rules of arithmetic. She is likewise said to have distinguished many colours and coins by the touch; played at cards, when prepared for her by private marks unknown by the company; and in her musical studies, her memory and quickness were wonderful: as she learned in general the most difficult pieces for keyed instruments, however full and complicated the parts, by hearing them played only on a violin: and since her arrival in this kingdom, she was enabled, in this manner, to learn to perform some of Handel's most elaborate and difficult organ fugues and movements in his first book of Lessons, as well as his Coronation Anthem, and more popular compositions.

Since her arrival in England she received a cantata, written for her in the German language, by the celebrated professor of mathematics, M. Pfeffel, of Colmar, who is himself blind. This cantata has been admirably set to music for her own voice and accompaniment on the piano forte, and she executed it in a truly pathetic and able manner. Her voice was not so powerful as her hand; but it is touching in itself, and her knowledge of music and circumstances rendered it doubly interesting.

Madame Paradis having entreated Dr. Burney, who has had letters from Germany in behalf of her ingenious daughter,

ter, and was very zealous in her service, to translate this cantata; we have procured the following copy of his version :

Cantata, written in German for Mad. Paradis, by her blind friend M. Pfeffel, of Colmar, and set to music by her music-maſter, M. Leopold Kozeleuch, of Vienna, November 11, 1784.

Imitated by Dr. Burney.

- “ The new-born infant sporting in the fun,
Is the true ſemblance of my infant ſlave,
When ev’ry prize for which life’s race is run
Was hidden from me by malignant fate.
- “ Infant deſtruction quench’d each viſual ray,
No mother’s tears, no objects were reveal’d !
Extinguiſh’d was the glorious lamp of day,
And ev’ry work of God at once conceal’d !
- “ Where am I plunged ? with trembling voice I cried,
Ah ! why this premature, this ſudden night !
What from my view a parent’s looks can hide,
Thoſe looks more cheering than celeftial light !
- “ How ſhould I wander through the gloomy maze,
Or bear the black monotony of woe,
Did not maternal kindneſs gild my days,
And guide my devious footſteps to and fro !
- “ Thereſa ! great in goodneſs as in power,
Whoſe fav’rite uſe of boundleſs ſway,
Was benefits on all to ſhower,
And wipe the tear of wretchedneſs away.
- “ When firſt my hand and voice eſſay’d,
Sweet Pergoleſi’s pious ſtrains,
Her pitying goodneſs ſhe diſplayed,
To cheriſh and reward my pains.
- “ But now, alas ! this friend to woe,
This benefactreſs is no more !
And though my eyes no light beſtow
They’ll long with tears her loſs deplore !
- “ Yet ſtill wher’er my footſteps bend,
My helpleſs ſtate has found a friend.
- “ The wreathes my feeble talents ſhare,
The balmy ſolace friends employ,
Lifting the ſoul above deſpair,
Convert calamity to joy.”

PARADIS. See PLATE *Forme*.

PARADISE, in *Geography*, a townſhip of America, in Pennſylvania, in the county of York, containing 1275 inhabitants.

PARADISE, a term primarily uſed for the place in which Adam was ſeated, during his innocence ; and from which he was expelled for diſobeying God : this is called, in a ſtricter manner, the *Terreſtrial Paradise*.

The word is formed of *παρδειſος*, *orchard*, a place ſtored with apples, and all kinds of fruits. Moſes calls it the *Garden of Eden*, q. d. garden of delight, from *עֵדֶן*, *edem*, *voluptas*, *pleaſure*.

The critics are in diſpute about the precise place of Paradise. Some, as Hardouin, &c. will have it in Judea, in the place where now is the lake Genefareth ; others, as Le Clerc, &c. in Syria, towards the ſprings of the Orontes, and Chryſorrhoe : but in neither of thoſe places do we diſcover any track of the rivers with which the Paradise in Moſes’s deſcription was watered. Calmet, and ſome other ingenious critics, have placed the terreſtrial Paradise in Ar-

menia, near mount Ararat, where Noah’s ark was left ; and imagine they there diſcover the ſources of the four rivers which watered the garden of Eden, *viz.* Euphrates ; Hiddekel, now the Tigris ; Gihon, now Araxes ; and Piſon, now Phazzo. But ſir J. Chardin aſſures us in his travels, that the Phazzo ſprings out of the mountains of Caucaſus, northward of the kingdom of Imereti, and far enough from mount Ararat : beſides, that in Armenia we have no ſigns of the countries of Havila and Ethiopia, which thoſe rivers waſhed after their departure from Eden.

There are various other opinions, as to this point : Poſtellus will have Paradise placed under the north pole ; grounding his notion upon an ancient tradition of the Egyptians and Babylonians, that the ecliptic or ſun’s way was at firſt at right angles to the equator ; and ſo paſſed directly over the north pole. Others are againſt limiting it to any one place, and contend, that it included the whole face of the earth, which was then, as it were, one continued ſcene of pleaſures, till altered upon Adam’s tranſgreſſion.

However, both theſe opinions are equally incompatible with the account in the book of *Genesis* ; others, as Origen, Philo, &c. interpret the ſcripture relation of Paradise allegorically.

But the moſt common and probable opinion is that of Hopkinſon, Huet, Bochart, &c. who place Paradise between the confluence of the Euphrates and Tigris, and their ſeparation. Theſe rivers are two of thoſe with which the garden of Eden was watered : Piſon was a branch ariſing out of one of them after their ſeparation ; and Gihon another branch ariſing from the other, on the ſide of Armenia, or the weſt : accordingly Ethiopia, one of the countries which theſe rivers waſhed, was inconteſtably Arabia Deſerta ; for Moſes calls his wife, who was of this country, an Ethiopian ; and Havilah, the other country, muſt have been the Chuiſtan in Perſia ; where were anciently found gold, bdellium, the onyx, &c. mentioned in Moſes’s deſcription.

The great difficulty in this ſyſtem is, that Moſes ſpeaks expreſſly of four rivers, each of which had its ſource in the garden of Eden ; whereas this gives us only two rivers, which were ſeparated into four branches. See EDEN.

PARADISE is alſo uſed in the New Teſtament, and by Chriſtian writers, for the final habitation of the bleſſed, or HEAVEN : which ſee.

PARADISE *Loſt*, a poem, which, whether it be referred or not to the claſs of thoſe poems that are denominated *Epic* (ſee that article), is juſtly deemed one of the higheſt efforts of poetical genius, and in one great characteristic of the epic poem, majeſty and ſimplicity, fully equal to any which bear that name. With reſpect to the choice of his ſubject, it has been queſtioned whether Milton was altogether happy ; and it has been ſuggeſted, that, if it had been more human, and leſs theological, and more connected with the occurrences of life, ſo as to have afforded a greater diſplay of the characters and paſſions of men, his poem would have been more acceptable and pleaſing to the bulk of readers. However, his ſubject was ſuited to the daring ſublimity of his genius. To this purpoſe Dr. Johnſon aſſures us, (*Life of Milton*,) that “ he ſeems to have been well acquainted with his own genius, and to know what it was that nature had beſtowed on him more beautifullly than upon others ; the power of diſplaying the vaſt, illuminating the ſplendid, enforcing the awful, darkening the gloomy, and aggravating the dreadful. He therefore choſe a ſubject, on which too much could not be ſaid ; on which he might tire his fancy, without the cenſure of extravagance.”

In the conduct of the ſubject which he has ſelected, he has ſhewn a very wonderful ſtretch of imagination and in-

vention, and he has admirably sustained the various characters—he has assumed, and made the most of the scanty materials which he derived from the sacred scriptures. Some, indeed, have lamented that he has added to these a variety of incidents, which have served to perpetuate erroneous doctrines in theology, and a system of demonology of his own creation, without sufficient warrant from the sacred writings. However this be, “the general tenor of his work is interesting; he seizes and fixes the imagination: engages, elevates, and affects us as we proceed; and this is always a sure test of merit in an epic composition. The artful change of his objects: the scene laid now in earth, now in hell, and now in heaven, affords a sufficient diversity, while unity of plan is at the same time perfectly supported. We have still life and calm scenes, in the employments of Adam and Eve in Paradise; and we have busy scenes, and great actions, in the enterprise of Satan, and wars of the angels. The innocence, purity, and amiableness of our first parents, opposed to the pride and ambition of Satan, furnish a happy contrast, that reigns throughout the whole poem:” though the conclusion is, in Dr. Blair’s opinion, too tragic for epic poetry. Although the nature of Milton’s subject did not admit any great display of characters, those which he has introduced are supported with much propriety. Satan is the best drawn character in the poem, inasmuch that some have said, either seriously or jocularly, that he was the hero of his poem. (See HERO.) The different characters of Beelzebub, Moloch, and Belial, are well painted in their eloquent speeches. Among the good angels, always described with propriety, though with greater uniformity than the infernal spirits in their appearance, the dignity of Michael, the mild condescension of Raphael, and the tried fidelity of Abdiel, form characteristic distinctions. In the adventurous attempt to describe God Almighty himself, and to recite dialogues between the Father and the Son, Milton, as we might naturally expect, has been most unsuccessful. With regard to human characters, the innocence of our first parents, and their love, are finely and delicately painted. Eve is more distinctly characterized than Adam. Her gentleness, modesty, and frailty, very expressively mark a female character.

Milton’s distinguishing excellence is his sublimity, in which he far surpasses Virgil, and every other poet, and is thought by some to excel even Homer. The prospect of hell, and of the fallen host, the appearance and behaviour of Satan, the consultation of the infernal chiefs, and Satan’s flight through chaos to the borders of this world, manifest the most lofty ideas that ever entered into the conception of any poet. Indeed, the first and second books are continued instances of the sublime. In the sixth book there is also much grandeur, particularly in the appearance of the Messiah; but in this book, the witticisms of the devils upon the effect of their artillery, form an intolerable blemish. It is observed that Milton’s sublimity is different from that of Homer. That of the latter is generally accompanied with fire and impetuosity; while Milton’s possesses more of a calm and amazing grandeur. Homer warms and hurries us along; Milton fixes us in a state of astonishment and elevation. Homer’s sublimity is most conspicuous in the description of actions; Milton’s in that of wonderful and stupendous objects. Milton also unites with his sublimity, much of the beautiful, the tender, and the pleasing, in many parts of his works. Milton’s language and versification possess high merit. His style is full of majesty, and wonderfully adapted to his subject. His blank verse is harmonious and diversified, and affords the most complete example of the elevation, which our language is capable of attaining by the force of numbers. “Upon the whole,” as Dr. Blair observes in the conclusion of his criti-

cism upon this poem, “Paradise Lost is a poem that abounds with beauties of every kind, and that justly entitles its author to a degree of fame not inferior to any poet; though it must be also admitted to have many inequalities. It is the lot of almost every high and daring genius, not to be uniform and correct. Milton is too frequently theological and metaphysical; sometimes harsh in his language; often too technical in his words, and affectedly ostentatious of his learning. Many of his faults must be attributed to the pedantry of the age in which he lived. He discovers a vigour, a grasp of genius equal to every thing that is great; if at some times he falls much below himself, at other times he rises above every poet, of the ancient or modern world.” Blair’s Lectures, vol. iii.

Mr. Addison’s criticisms on the Paradise Lost contained in the “Spectator,” are in every body’s hands. They comprehend the fable, the characters, the sentiments, and the language of this poem. See ACTION, EPIC Poem, FABLE, &c. &c. See also the biographical article of MILTON.

PARADISE, *Birds of*, in *Ornithology*. See PARADISEA.

PARADISE, *Golden Bird of*. See ORIOLUS Aureus.

PARADISE Sound, in *Geography*, a bay on the S.W. part of Placentia, on the coast of Newfoundland. N. lat. 47° 30'. W. long. 54° 15'.

PARADISEA, the Bird of Paradise, in *Ornithology*, a genus of birds of the order Picæ, of which the generic character is; bill covered with a belt of downy feathers at the base; feathers of the sides very long; two of the tail-feathers naked; legs and feet very large and strong. These birds chiefly inhabit New Guinea, from which they migrate in the dry season into the neighbouring islands. Their feathers are used in these countries as ornaments for the head-dress; and the Japanese, Chinese, and Persians import them for the same purpose. Among the latter, the principal people attach these brilliant collections of plumage, not only to their own turbans, but to the housings and harness of their horses. They are seldom found many degrees beyond the equator. Gmelin enumerates twelve species, Shaw fifteen, and Latham only eight. We shall give those of Gmelin.

Species.

APODA; Greater Bird of Paradise. Chestnut; neck beneath gold-green; feathers on the sides longer than the body; the two middle tail-feathers are long and bristly. There is a variety which is less, and the body above is yellow; the feathers on the sides are yellowish-white. The two long tail-feathers are naked, straight, and tapering to the tip; the tail, as it is improperly called, is nothing more than the long feathers of the back and flanks. These birds are found in the Molucca islands, and those surrounding New Guinea, particularly in Aroo, where they arrive with the westerly or dry monsoon, and whence they return to New Guinea, when the easterly or wet monsoon sets in. They are seen going and returning in flights of thirty or forty, conducted by a leader, which flies higher than the rest. During this flight they cry like starlings. By a sudden shifting of the wind, their long scapular feathers are sometimes so dishevelled as to preclude flying, when they fall to the ground, or are lost in the water. In the former case they cannot rise again into the air, without gaining an eminence, and are secured by the natives, and killed on the spot, as they cannot be preserved alive by art. They are likewise caught with bird-lime, or shot with blunt arrows, or are sometimes intoxicated with the berries of *Menispermum cocculus* put into the water which they are accustomed to drink. Their real food is not known with certainty. According to some authors, they feed on the red berries of the *Waringa-tree*, the *Ficus benjamina*; according

ording to others they are particularly fond of nutmegs; some assert that they live on large butterflies and moths, and others that they chase and devour small birds.

REGIA; King's Bird of Paradise. This is of chestnut-purple, whitish beneath; two middle tail-feathers filiform, feathered, and femilunar at the tips; the breast is blueish; the cirri of the tail are very long; the feathers under the wings are longer than the rest; the tail is short and truncate; from five to seven inches long, and about the size of a lark. It is said not to associate with any other birds of Paradise, but shifts in a solitary state from bush to bush in quest of red berries, and never gets on tall trees. It is found on the islands of the Indian ocean, and returns to New Guinea in the rainy season.

TRISTIS; Grakle Bird of Paradise. This has a triangular naked space behind the eyes; the head and neck are brown. It inhabits the Philippine islands; is nine inches and a half long; feeds on fruit, insects, mice, and every kind of grain; builds twice a-year in the forked branches of trees; it lays four eggs; when young it is easily tamed, and becomes docile and imitative. The bill and legs are yellow; the body is brownish; the first quill-feathers are white from the base to the middle; tail-feathers, except the middle ones, are tipped with white. This bird has a great affinity in all its habits to the grakle genus, yet, on account of the downy feathers at the base of the bill, it is placed among the birds of Paradise.

MAGNIFICA; Magnificent Bird of Paradise. Chestnut-brown above; chin green, with golden lunules; crown with a tuft of yellow feathers. It inhabits New Guinea, and is about nine inches long. This is a singularly beautiful species, and a figure of it is given by Latham. The first quill-feathers are brown, secondary deep yellow; middle tail-feathers very long, with a short fringe; legs and bill yellow, the latter black at the base and tip.

CIRATA; Crested Bird of Paradise. Head, neck, and wings black; tuft of hairs near the crown and frontlet yellow. It inhabits New Guinea, and is eighteen inches long.

NIGRA; Gorget Bird of Paradise. Black; beneath slight green; hind head, nape, crown, and band on the middle of the belly fine green, under the chin a splendid gold-coloured crescent. It inhabits the islands of the Indian ocean, and is twenty-eight inches long. There are twelve unequal tail-feathers, the outer ones five inches long, and the two in the middle about twenty-two inches.

LEUCOPTERA; White-winged Bird of Paradise. Black; crown shining copper; quill-feathers white, edged with black on the outside; the tail is very long and wedged.

SUPERBA; Superb Bird of Paradise. This species is crested; the head, crown, and belly are green; the chin is violet, silky; wings black; tail with a shade of green. It is found in New Guinea, and is about ten inches long. The bill is black; the legs are brown; under the wings a tuft of loose, black, silky feathers, as long as the wings when folded.

FURCATA. This is black; under the wings is a downy tuft; feathers in the middle of the belly like a forked tail; shining-green.

AUREA; Gold-breasted Bird of Paradise. Crested, black; crown, cheeks, and chin violet-black; throat, spot on the neck, and breast shining-green; at the region of the ears, on each side, are three long bristly feathers. It inhabits New Guinea, and is the size of a turtle dove.

VIRIDIS; Blue-green Bird of Paradise. Sea-green; back, belly, rump, and tail steel-blue. It inhabits New Guinea, and is sixteen inches long. The bill is thick and

black; the plumage on the head is silky, and on the body it appears as if it were crisp at the tips.

ALBA; White Bird of Paradise. This is entirely white, and is the rarest of all the species. It is found in the Papuan islands. A variety of it is black on the fore-part, and white on the hind-part.

"In the second edition of Pennant's Indian Zoology," says Dr. Shaw, "may be found a good general description from Valentyn, of this remarkable genus, by Dr. J. Reinhold Forster, preceded by a very learned dissertation on the fabulous phoenix of antiquity, a bird of the size of an eagle, decorated with gold and purple plumes, and more particularly described by Pliny, as having the splendour of gold round the neck, the rest of the body purple, the tail blue, varied with rose-colour, the face adorned with wattles, and the head furnished with a crest. This imaginary bird, Dr. Forster supposes to have been no other than a symbolical Egyptian illustration of the annual revolution of the sun, and the conversion of the great year, which corresponds with the supposed life of the phoenix, and from which period the same course of seasons and positions of the heavenly bodies is renewed." These notions, then, says Dr. Forster, are to be explained by the theology of Egypt. Though the birds of Paradise were never known to the ancients, and though what has been said by the Egyptian priests concerning the fabulous phoenix, has but little agreement with the bird of Paradise, yet it is remarkable that the names applied both by the Indian and European nations to these birds, appear to attribute something of a supposed celestial origin to them. In all probability, says Dr. Shaw, this notion has arisen merely from their transcendent beauty, and the singular disposition and delicacy of their plumage.

PARADISIACA, in *Botany*, a name given by some authors to the *arbor vite*, or *thuya*.

PARADISUS, among *Ancient Church Writers*, denoted a square court, before cathedrals, surrounded with piazzas, or porticos for walking under, supported by pillars. Matthew Paris calls it *parvifus*.

PARADOX, Παράδοξον, formed from παρά, *against*, and δοξα, *opinion*, in *Philosophy*, a proposition seemingly absurd, because contrary to the received opinions; but yet true in effect.

The Copernican system is a paradox to the common people; but the learned are all agreed as to its truth.

Geometricians have been accused of maintaining paradoxes; and it must be owned, that some use very mysterious terms in expressing themselves about asymptotes, the sums of infinite progressions, the areas comprehended between curves and their asymptotes, and the solids generated from these areas, the length of some spirals, &c. But all these paradoxes and mysteries amount to no more than this: that the line or number may be continually acquiring increments, and those increments may decrease in such a manner, that the whole line or number shall never amount to a given line or number.

The necessity of admitting this is obvious from the nature of the most common geometrical figures: thus, while the tangent of a circle increases, the area of the corresponding sector increases, but never amounts to a quadrant. Neither is it difficult to conceive, that if a figure be concave towards a base, and have an asymptote parallel to the base (as it happens when we take a parallel to the asymptote of the logarithmic curve, or of the hyperbola, for a base), that the ordinate in this case always increases while the base is produced, but never amounts to the distance between the asymptote and the base. In like manner, a curvilinear area may increase while the base is produced, and approach continually

tinually to a certain finite space, but never amount to it; and a solid may increase in the same manner, and yet never amount to a given solid. See LOGARITHMIC Curve.

A spiral may in like manner approach to a point continually, and yet in any number of revolutions never arrive at it; and there are progressions of fractions which may be continued at pleasure, and yet the sum of the terms shall be always less than a given number. See Maclaurin's Fluxions, book i. ch. 10. seq. where various rules are demonstrated, and illustrated by examples, for determining the asymptotes and limits of figures and progressions without having recourse to those mysterious expressions which have of late years crept into the writings of mathematicians. For, as that excellent author observes elsewhere, though philosophy has, and probably always will have, mysteries to us, geometry ought to have none.

PARADOXES, *Hydrostatical*. See FLUID.

PARADOXI, or PARADOXOLOGI, among the *Ancients*, were a kind of mimes or buffoons, who diverted the people with their drolling.

They were also called *ordinarii*, for this reason apparently, that, as they spoke without study or preparation, they were always ready.

They had another denomination, *viz. nianicologi, q. d. tellers of children's tales*: and beside were called *aretalogi*, of *αρετα*, *virtue*, or talking much of their own rare talents and qualifications.

PARÆA, in *Zoology*, the name of a species of serpent, called also *anguis Æsculapii*. It is a perfectly innocent and harmless creature, and is so little dreaded by the inhabitants, that it is common about their houses, and even sometimes gets into their beds. Its mouth is full of very small teeth, and when much provoked, it is sometimes known to bite, though without any bad symptoms attending the wound; it is a very long kind, and is of a yellowish-green colour on the sides, and blackish on the back; it has two small eminences on the neck, and between them two small sinews. It is very common in Spain, Italy, and most other of the warm countries.

PARÆNESIS, *παραινσις*, formed of *παρα*, and *αινω*, *I praise*, a Greek term, signifying adoration or exaltation.

PARAGAUDÆ, among the Romans, a sort of wreaths, either wholly of gold, or of silk adorned with gold, which were interwoven in garments and not sewed to them. The garment was sometimes of one colour, in which was woven one paragauda; others were of two colours, and had two paragaudæ; and some had three colours, and three paragaudæ. They were worn both by men and women.

PARAGE, PARAGIUM, in *Law*, an equality of blood or dignity, but more especially of land, in the partition of an inheritance between coheirs.

PARAGE, *Paragium*, is more properly used, in ancient customs, for an equality of condition among nobles, or persons holding nobly.

Thus, when a fief is divided among brothers; in this case, the younger hold their part of the elder by parage, *i. e.* without a y homage or service.

This still obtains, in some measure, in Scotland, where the husbands of the younger sisters are not obliged to any faith or homage to the husband of the elder; nor their children to the second degree.

This parage being an equality of duty or service among brothers and sisters, some have called it *fratriage* and *parentage*.

The Customary of Normandy defines enure by parage to be, when a noble fief being divided among daughters, the eldest does homage to the chief lord for all the rest, and the

youngest hold their parts of the rest by parage, *i. e.* without any homage or fealty.

Parage ceases at the sixth degree inclusively. It likewise ceases when any of the sisters sell their part.

PARAGLOSSA, from *παρρα*, and *γλωσσα*, *the tongue*, in *Surgery*, a prolapsus of the tongue; or a protrusion of it from the mouth.

PARAGOGE, *παρρωγιη*, in *Grammar*, a figure whereby a word is lengthened out by adding a syllable at the end of it: as in *dicier* for *dici*.

PARAGOGE is also a word used by medical writers to express a reduction of luxated bones.

PARAGOGIC, formed of *παραγω*, *I prolong*, compounded of *παρα* and *γω*, in *Grammar*, denotes something added to a word without adding any thing to its sense.

In the Hebrew, the ה is frequently paragogic; as in אברכה, for אברך, *I will praise*. The paragogic letters are the five following, *viz. ו י ה ה א*; to which some add the ה.

The use of paragogic letters is only to give a more full and agreeable sound to words, either for the sake of the verse, or the smoothness of the period. As in the Hebrew letters are sometimes added "euphonia gratia," so likewise the four following letters, *viz. ה ו י ו*, which, according to the grammatical rules, ought to be present, are omitted.

PARAGON, in *Geography*, one of the largest of the Calamianes islands, in the East Indian sea.

PARAGONE, in *Natural History*, the name given by many to the basaltas, a black marble, used as a touchstone.

PARAGRAPH, *Παραγραφος*, a term in *Jurisprudence*, signifying a section or division of the text of a law: otherwise called an *article*.

Such a law is said to be divided into so many paragraphs.

The character of a paragraph in quotation, is ¶.

Among the Greek poets, paragraphs, *παραγραφοι*, were a species of critical notes, serving to mark the couplets, strophes, and other divisions of odes, and other poetical compositions. This paragraph, as described by the scholiast of Aristophanes, was a short line, with a dot at the extremity of it.

PARAGUA, in *Ornithology*, the name of a Brazilian parrot, of the size of our common green parrot; but its back is all black, and its breast and the forepart of its belly are of a beautiful red; its eyes are black, with a red circle round them; its beak brown, or a very dusky grey, and legs and feet grey. See PSITTACUS *Paraguanus*.

PARAGUARE, in *Geography*, a town of Brazil, on the river of the Amazons. S. lat. 3° 10'. W. long. 65° 56'.

PARAGUAY, or PALAWAN, the most westerly of the Philippine islands, about 180 miles in length, and 21 in breadth; 190 miles E.N.E. of Mindanao. N. lat. 8 12' to 11° 31'. E. long. 117° 21' to 119° 40'.

PARAGUAY, a river of South America, which rises about W. long. 58 between the 5th and 6th degrees of S. lat. After pursuing an almost due S. course, it joins the Plata in S. lat. 28°. W. long. 60° 36'. The word "Paraguay" means "the crown," or a kingly stream.

PARAGUAY, a province of the viceroyalty of La Plata or Buenos Ayres, called the "Government of Paraguay." This government lies S. of Santa Cruz de la Sierra and E. of Tucuman. Southward it joins to that of Buenos Ayres, and eastward it is terminated by the captainship of St. Vicente in Brazil, the capital of which is the city of St. Pablo. These countries were first discovered by Sebastian Gaboto or Cabot (see CABOT), who, coming to the river of Plata in the year 1526, sailed up the Parana in small barks,

PARAGUAY.

barks, and thence entered that of Paraguay. In 1536 he was succeeded by Juan de Ayolas, to whom Don Pedro de Mendoza, the first governor of Buenos Ayres, had given a commission, together with a body of troops, military stores, and other necessaries; and, afterwards, by his orders, Juan de Salinas founded the city of Nuestra Señora de la Assumption, the capital of the province; but the discovery of the whole, and consequently the conquest of the people who inhabited it, being still imperfect, it was prosecuted by Alvar Nunez, surnamed Cabeza de Baca, or Cowhead, whose eminent services, on the death of Don Pedro de Mendoza, procured for him the government of Buenos Ayres. The only settlements, in the whole extent of this government, is the city of Assumption, Villa Rica, and some other towns, inhabited by converted Indians, who were once entirely under the administration of the Jesuits. The province is distinguished by its fertility, and though it produces none of the precious metals, it is the most opulent in the new viceroyalty, on account of its various vegetable productions, and the prodigious herds of horses, mules, cattle and sheep, which enliven its extensive plains. The northern parts, however, of Paraguay have been little explored, as the settlements of the Jesuits were chiefly in the southern skirts, and among the adjacent Abipons and Guaranis. It was in the year 1580 that the Jesuits were first admitted into these fertile regions, where they afterwards, in the reign of Philip III., founded the famous Missions, which in Europe have been known under the name of Paraguay, but in America Uruguay, from the river of that name on which they were situated. Actuated by motives of religion and of interest, they were diligent and zealous in the service assigned them of converting the Indians to the Catholic faith; and by a gradual progress their labours were attended with very considerable success. The Jesuit missionaries had previously stipulated with the court of Spain, that for the more effectual accomplishment of their purposes in converting and civilizing the Indians, they should be independent of the governors of the province, and that they should annually receive from the royal treasure 60,000 piastres for defraying the expences of cultivation; on condition that as colonies were formed and the lands cultivated, the Indians should pay yearly a piastre *per* head to the king, from the age of eighteen to sixty. The Jesuits thus encouraged embarked in the execution of their enterprize with singular resolution and ardour, and notwithstanding the difficulties with which they had to contend, succeeded in civilizing the barbarous Indians, introducing among them useful and polite arts, and forming them into a state of mutual association and amity, of profitable labour and domestic comfort. Their missions extended over a country, which contained about 200 leagues N. and S. and about 150 E. and W.; and the number of inhabitants was about 300,000. From the immense forests they derived all kinds of wood, and the extensive pastures were covered with at least two millions of cattle.

The country was divided into parishes, and each parish was under the direction of two Jesuits, who officiated, the one as rector, and the other as curate. The establishment was supported at an expence, which, comprehending the magnificent structure and ornaments of the churches, was not very considerable; as the Indians supported themselves by their own labour. The products of the ground and cattle belonged to the Jesuits, who provided instruments of various trades, for glass, knives, needles, chaplets of beads, gunpowder, and muskets. Their annual revenues consisted in cotton, tallow, leather, honey, and more especially *Mathe*, or herb of *Paraguay* (which see,) monopolized by the society, and yielding, according to the statement of

Dr. Robertson in his "History of America," 500,000 pesos, at 4s. 6d each. The whole system of administration, planned and conducted by the Jesuits, was so formed as to keep the Indians in perfect subordination to the rectors; whilst they were provided with means of instruction in various departments of science, such as music, painting, sculpture, and architecture, and also of manufacture and trade; and at the same time their attention was directed to the regular performance of religious ceremonies and duties.

The society of Jesuits was thus employed in extending its missions, and establishing its authority, when their designs and labours were entirely terminated by the Spanish court, which decreed their expulsion throughout its widely spread dominions. The missions upon the Uruguay, of which we have above given a concise account, were not the only ones founded by the Jesuits in South America; northward and southward they made progress in carrying their plans of government into effect, and multiplying their establishments. When their effects in this province were confiscated, it was expected that large sums of hoarded money would have been found; but these, in their whole amount, were very trifling. Their magazines, indeed, were furnished with all sorts of merchandize, consisting of the products of the country, and of goods imported from Europe; the number of their slaves was also very considerable, inasmuch, that at Cordova alone they reckoned 3500. In detailing botanical notices, with respect to the province of Paraguay, by the assistance of Dobrizhoffer's communications, in the first volume of his work, we shall cursorily mention the tree, which bears the quinquina or Jesuits' bark, the sarsaparilla, rhubarb, jalap, saffaras, the guayacur, the zamu, called from its form the drunkard, the mangay, yielding the elastic juice applied in Europe to various purposes, the caa, from which is obtained the resin called dragon's blood, the cupay, whose precious oil is used in medicine, the nux vomica, the vanilla, the tree which yields chocolate, the timbabi, which supplies store of a beautiful golden gum, that is run into moulds and formed into crosses, necklaces, and ear-rings, straight and lofty cedars, and the American pine called cury, harder than the European, and marked with red veins, of the knots of which exuding a red juice, and appearing varnished, the Guaranis make elegant images; several species of the algarobba or carob tree, of which are made a bread by pounding it in a mortar, and a wholesome drink by infusing it in cold water, which is said to be a radical cure for consumptions, and to possess a strong diuretic virtue: the paraguay already mentioned, numerous and beautiful species of palm, figs, peaches, pomegranates, lemons, and large oranges. Among the native fruits are the jujub, the chanar, the yacani, the quabyra, of a species of which candles are made for divine service, the passion-flower plant, the fruit called quembe, yielding a delicious pulp, the mammon growing on the trunk of a tree, and approaching to the melon, the tatay, producing a fruit like the mulberry, the alaba, whose fruit is delicious and refreshing, the anguay, the pips of which are of a splendid violet colour, and triangular shape, used by the Indian women for making necklaces, the tarumay, resembling the olive, the molle, yielding a copious and fragrant gum, the bacoba, banana, and anana, the manioc, the cotton-tree, which is a common plant, the zevil, yielding a bark useful in tanning, the seibo, bearing flowers of a violet colour, the izapi, whose leaves distil a copious supply of water, the ant-tree, the chosen haunt of these insects, the umbu, which might cover 50 men with its thick shade, the willow, the ambay, used in striking fire, the urucuy, a shrub yielding a strong scarlet dye, indigo, cochineal, nakalie, whose beautiful yellow is used by dyers and painters, the

caraquata

caraquata of the Guaranis, or maguey of the Mexicans, resembling an aloe, reeds of a prodigious size, the sugar-cane, various species of rosemary, rue, mint, sage, borragé, &c.; maize, or Indian corn, of which is made the favourite drink of the Indians, called chicha, or alloja, potatoes of large size, white, red, and yellow, which latter are the best, the mani, resembling the almond in taste and form, of which there are several kinds, the oil of which is superior to that of the olive; European beans, peas, melons, cucumbers, lettuce, turnip, mustard, cresses, leeks, and onions, asparagus found wild in the fields, wheat in large quantities, and the vine. Paraguay in particular produces a generous and healthy wine, but the roots are destroyed by the prodigious number of ants. Of quadrupeds it has been said, that here are the glama or lama, the guanoco, the macmorro, or chilibueque of the Chikea, the vicuna, and the paco or alpaco. (See CAMELUS.) But a late author, Azara, has omitted them in his work, and it has been accordingly affirmed, that they are totally unknown in Brazil, a town in Paraguay. The American tiger or jaguar is chiefly known in Paraguay, and the forests to the north. Other animals are the wild cat, the elk, the ant-bear, a kind of deer, &c. A species of ostrich is found in the wide plains of Paraguay. Dobrizhoffer counted nine kinds of picafior, or humming-bird, in this province; and here are also about 20 kinds of serpents, among which the rattle-snake is not uncommon. See LA PLATA.

PARAGUAY, or *Paragoué*, in *Natural History*, a celebrated plant of the shrub kind, growing in some provinces in South America, especially in that of Paraguay, whence its name, though better known among us under the denomination of *South-sea tea*. See *ILEX Vomitoria*.

This plant, which does not rise above a foot and a half high, has very slender branches, and leaves somewhat like those of fenna; it may be looked on as a kind of occidental tea, which, like the oriental, is taken infused in hot water, to which it communicates a colour and smell nearly like those of the best tea seen in Europe.

There are two kinds of paraguay, the one called simply *paraguay*; the other *caamini*, (which see,) by the Spaniards, *yervacamini*; which last is most esteemed, and sold for a third more than the other.

The first the Spaniards called the *yerva-con-palos*, i. e. *herb with little sticks*, because full of broken branches: this is chiefly used by domestics and slaves: the latter is the drink of the richest. But both are of so much use, and esteemed of such absolute necessity, that nobody in that part of America will live without them. The works of the mines of Potofi would stand still, but that the masters take care to supply the slaves that labour therein with paraguay, which is their constant remedy against those mineral steams, with which they would otherwise be suffocated. Nor will a servant engage himself with any master, but upon this among other conditions, that he have nothing but paraguay for drink.

The paraguay makes one of the most considerable articles of the South American commerce. At Peru, Chili, and Buenos Ayres, there are above two millions worth sold *per annum*; which used to pass almost altogether through the hands of the Jesuits.

The preparation of the plant, and the making it into drink, is much the same with that of tea, except that they infuse both the leaves and the wood, that they drink it immediately out of the vessel it is made in, without letting it have time to infuse, by reason of the black tincture it gives; and that, to prevent leaves and all from coming, they suck it through a silver or glass pipe, which goes round the company one after another. Frezier.

Beside all the virtues which the eastern people ascribe to their tea, as to be good in diseases of the head, breast, and stomach against phlegm, and to restore sleep; the Americans attribute to their's this likewise, of purifying all kinds of water, how foul and corrupt soever, by only infusing it therein, either hot or cold. Thus, having always some of it with them, if they meet with none but the worst waters in the vast deserts to be crossed in going from Buenos Ayres to Peru and Chili, they are not afraid to drink them, after steeping some of the plant a little while therein. It is also held sovereign against the scurvy and putrid fevers.

PARAGUR, in *Geography*, a ruined town of Hindoostan, in the circar of Gohud; 25 miles S. of Narwa.

PARAH, in *Commerce*, a corn measure in the East Indies. At Madras, the garee, corn-measure, contains 80 parahs, or 400 marcals, and the marcal, 64 o'locks. The marcal should measure 750 cubic inches, and weigh 27 lb. 2 oz. 2 dr. avoirdupois of fresh spring water; hence, 43 marcals = 15 English bushels, and the garee = 17½ English quarters nearly. When grain is sold by weight, 9256½ lbs. are reckoned for 1 garee, being 18 candies 12¾ marcals.

At Bombay, the candy, dry measure, contains 8 parahs; the parah, 16 adowlies, 64 seers, or 128 tiprees. This serves for wheat and all grain but rice, or batty, which is sold by the batty measure, as follows; the morah contains 4 candies, or 25 parahs; the parah, 20 adowlies, 150 seers, or 300 tiprees.

PARAH, in *Geography*, a town of Bengal; 10 miles W. of Rogonapour. N. lat. 23° 3'. E. long. 86° 39'.

PARAIBA, or PARA-IBA, a town of Brasil, and capital of a province or captaincy of the same name, which it derives from that of a river, on the S. bank of which it is situated, about 10 miles from the sea; the river being navigable above the town for ships loaded with 600 or 700 hogfheads of sugar. The harbour is large, but rather dangerous on account of the sand-banks. The town has many stately houses, decorated with marble pillars, besides large warehouses and magazines for the accommodation of the merchants. The mouth of the river is defended by three forts. The Portuguese, who took possession of this town and territory in 1584, after having expelled the French, have increased its buildings, planted sugar-canes, and erected sugar-mills. The whole territory is fertile in sugar-canes, and abounds in Brasil wood, cattle, tobacco, cotton, &c.; 60 miles N. of Fernambuco. S. lat. 7° 15'. W. long. 34° 3'.

PARA-IBA *de Sul*, a river of Brasil, which runs into the Atlantic. S. lat. 7° 15'. There is another river in the south, of the same appellation.

PARAKIN, a town of Servia; 32 miles N.N.W. of Nissa.

PARALAMPSIS, from *παρὰ λαμπρῶν*, *to shine a little*, in *Surgery*, a white opacity of the cornea of the eye.

PARALAPUTTY, in *Geography*, a town of Hindoostan, in Myfore; 10 miles from Sankeridurgum.

PARALEA, in *Botany*, so called by Aublet from the Caribbean word *parala*, a genus of that author's, of which the characters, as far as concerns the female parts of fructification, and the nature of the fruit itself, are unknown. It belongs to the *Polyandria*, or rather *Dodecandria*, of Linnæus, and is ranged by Jussieu among his *Guaiaacanz* with indefinite stamens, between *Ciponima* of Aublet, and *Hopea* of Garden and Linnæus, both which are now known to belong to the *Symplocos* of Jacquin and Linnæus, as l'Heritier first suggested. We may therefore presume to reduce the *Paralea* to the same genus; even though no such collection of its stamens into parcels has been observed, as is found in various species of *Symplocos* already known; for that might easily

easily escape detection in such small flowers as these are represented. See Aubl. Guian. t. 231. Lamarck Illustr. t. 454. Juss. 157.

The tree is said to be lofty, with a hard white wood. Leaves alternate, on short stalks, oval, entire, coriaceous, dark green, smooth, except a fringe of white hairs in their early state, which are deciduous. Flowers pleasantly scented, in little axillary tufts, accompanied by small, downy, reddish scales or bractæas. Calyx of one leaf, downy, reddish, with four sharp teeth. Corolla with a short inflated quadrangular tube, and a limb in four small, fleshy, red lobes. Stamens 18, shorter than the corolla. A little prismatic body, covered with red hairs, is found in the centre of the flower. This tree blossoms in October. The natives of Guiana, where it grows, about 50 miles from the sea-coast, bathe themselves with a decoction of its bark when they are attacked with fevers.

PARALEPSIS, Παραλεψις, in Rhetoric, a pretence of omitting or passing over a thing, and yet expressing it by the way.

The design of this figure, according to Hermogenes, is to possess the minds of the audience with more than the words express, and it is principally made use of on three occasions: either when things are small and yet necessary to be mentioned; or well known, and need not be enlarged on; or ungrateful, and therefore should be introduced with caution, and not set in too strong a light. When the imagination is warmed, and reasons and arguments present themselves in abundance, the orator would willingly lay them all down, in form; but for fear of wearying his audience, he only produces some of them *en passant*, and without dwelling on them: and this is called a *paralepsis*, by the Latins *præteritio*, by the Greeks *apospopefsis*.

For instance, I pass over in silence the many injuries I have received, &c. I won't insist on this last outrage. See Ep. to Philemon, v. 19.

PARALIA, Παραλία, in Antiquity, a day kept in memory of an ancient hero, called Paralus.

PARALIA was also the name of one of the Athenian tribes.

PARALIPOMENA, Παραλιπομείνα, a supplement of things omitted and forgot, in some preceding work, or treatise. The word is formed from the Greek παραλειπω, *prætermitto*, I pass by. Some authors use the word *subreclitum* instead of *paralipomenon*.

In the canon of Scripture, there are two books of Paralipomena, called in the English version Chronicles; being a supplement to the four books of kings, the two first of which are also called books of Samuel.

Quintus Calabar has a work, entitled the Paralipomena of Homer.

PARALLACTIC ANGLE, called also simply *parallax*, is the angle made in the centre of a star by two right lines, drawn, the one from the centre of the earth, T B, (Plate XVIII. Astron. fig. 4.) the other from its surface, E B.

Or, which amounts to the same, the parallactic angle is the difference of the angles C E A, and B T A, under which the real and apparent distances from the zenith are seen.

The sines of the parallactic angles A L T and A S T, (fig. 5.) at the same or equal distances from the zenith S Z, are in a reciprocal ratio of the distances of the stars from the centre of the earth, T L and T S.

PARALLAX, Παραλλαξις, in Astronomy, an arc of the heavens intercepted between the true place of a star, and its apparent place.

The true place of a star is that point of the heavens B, (fig. 4.) in which it would be seen by an eye placed in the centre of the earth as at T. The apparent place is that point of the heavens C, in which the star appears to an eye on the surface of the earth as at E. Now, as, in effect, we view a celestial body not from the centre, but from the surface of our earth, which is a semi-diameter distant from the centre; we see it by a visual ray, which passing through the centre of the star, and proceeding thence to the surface of the mundane sphere, marks out another point C, which is its apparent place.

The difference of places, is what we call absolutely the *parallax*; παραλλαξις, or the *parallax of altitude*; by Copernicus it is called the *commutation*; which, therefore, is an angle formed by two visual rays, drawn the one from the centre, the other from the circumference of the earth, and traversing the body of the star; and is measured by an arc of a great circle intercepted between the two points of the true and apparent place, C and B.

The nature and effects of the parallax may be otherwise familiarly illustrated by adverting to Plate XVIII. fig. 9. Let C be the centre of the earth, A the place of the spectator on its surface, S any object, Z H the sphere of the fixed stars, to which the places of all the bodies in our system are referred; Z the zenith, H the horizon; draw C S M, A S n, and m is the place of S seen from the centre, and z from the surface. As the plane S A C passes through the centre of the earth, it must be perpendicular to its surface, and consequently pass through the zenith Z; and the points m, n, lying in the same plane, the arc of parallax, m n, must lie in a circle parallel to the horizon; and hence the azimuth is not affected, if the earth be a sphere. Now the parallax, m n, is measured by the angle m S n, or A S C; and (by trigonometry) C S : C A :: sin. S A C or sin. S A Z its supplement : sin. A S C the parallax = $\frac{C A \times \sin. S A Z}{C S}$.

But C A being constant, on the supposition of the earth's being a sphere, the sine of the parallax varies as the sine of the apparent zenith distance directly, and the distance of the body from the centre of the earth inversely. Hence, a body in the zenith has no parallax, and at s in the horizon it is the greatest. If the object be at an indefinitely great distance, it has no parallax; and therefore the apparent places of the fixed stars are not altered by it. As n is the apparent place, and m is called the true place, the parallax depresses an object in a vertical circle. For different altitudes of the same body, the parallax varies as the sine, s, of the apparent zenith distance; therefore, if p = the horizontal parallax, and radius be unity, we have 1 : s :: p : p s, the sine of the parallax. In order, therefore, to determine the parallax at all altitudes, we must first find it at some given altitude. Vince's Elem. of Astronomy, 1810.

PARALLAX of Declination, is an arc of a circle of declination S I, (fig. 6.) whereby the parallax of altitude diminishes the declination of a star.

PARALLAX of Right Ascension and Descension, is an arc of the equator D d, (fig. 6.) whereby the parallax of altitude increases the ascension, and diminishes the descension.

PARALLAX of Longitude, is an arc of the ecliptic T t, (fig. 7.) whereby the parallax of altitude increases or diminishes the longitude.

PARALLAX of Latitude, is an arc of a circle of latitude S I, whereby the parallax of altitude increases or diminishes the latitude.

PARALLAX, Mensural, of the Sun, is an angle formed by two right lines, one drawn from the earth to the sun, and another

PARALLAX.

another from the sun to the moon, at either of their quadratures.

PARALLAX of the annual orbit of the earth, is the difference between the heliocentric and geocentric place of a planet, or the angle at any planet, subtended by the distance between the sun and earth.

PARALLAX is also used for the angle made in the centre of the star by two right lines, drawn, the one from the centre, the other from the surface of the earth.

This is also called *parallactic angle*. Hence the parallax diminishes the altitude of a star, or increases its distance from the zenith; and has, therefore, a contrary effect to the refraction.

The parallax of altitude C B, (*fig. 4.*) is, strictly, the difference between the true distance from the zenith C A, and the apparent distance B A.

The parallax is greatest in the horizon; in the zenith, or meridian, a star has no parallax at all; the true and apparent places then coinciding.

The horizontal parallax is the same, whether the star be in the true, or the apparent horizon.

Few, if any, of the fixed stars have any sensible parallax, by reason of their immense distance, to which the semi-diameter of the earth is but a mere point. See STAR.

Hence also, the nearer a star is to the earth, the greater is its parallax, at an equal elevation above the horizon; and Saturn is so high, that it is difficult to observe in him any parallax at all.

The parallax increases the right and oblique ascension, diminishes the descension; diminishes the northern declination and latitude in the eastern part, increases them in the western; increases the southern in the eastern and western part; diminishes the longitude in the western part, increases it in the eastern. The parallax, therefore, has just opposite effects to the refraction.

Hence the parallax of the remoter star S (*fig. 5.*) is less than the parallax of the nearer L, at the same distance from the zenith; as before observed.

The sines of the parallactic angles M and S, of stars equally distant from the centre of the earth T, are as the sines of the distances seen from the vertex Z M, and Z S. Hence, the distances from the vertex decrease, *i. e.* as the altitudes decrease, the parallax increases; and hence, also, the parallax affects the altitude of the star, from the horizon to the zenith.

The doctrine of parallaxes is of the utmost importance, in astronomy, for determining the distances of planets, comets, and other phenomena of the heavens; for the calculation of eclipses, and for finding the longitude. Methods of finding the parallaxes of the celestial phenomena are various: some of the principal and easier follow.

To observe the PARALLAX of a celestial Phenomenon.—Observe when the phenomenon is in the same vertical with a fixed star which is near it, and measure its apparent distance from the star; observe, again, when the phenomenon and fixed star are at equal altitudes from the horizon; and again measure their distance. The difference of those distances will be, very nearly, the parallax sought. The parallax of a phenomenon may be likewise found by observing its azimuth and altitude; and by marking the time between the observation, and its arrival at the meridian.

All required to find the parallax of the moon is, the parallax of right ascension: to find the effect of the magnitude of the semi-diameter of the earth, with regard to the phenomena of its motion, it is sufficient to know how far the meridian, to which the eye refers it, deviates from the true meridian. This is what M. Cassini found and practised with

regard to Mars; and what M. Maraldi has since practised with regard to the moon. The whole mystery here consists in having the moon's true motion, which refers to the centre of the earth; and its apparent motion, which refers to the place of observation: the difference of these, which is greatest in the horizon, or horary circle of six o'clock, gives the horizontal parallax for that latitude; whence the general parallax, or that under the equator, is easily found: the parallax of any parallel being to that of the equator, as the semi-diameter of this parallel is to that of the equator. See the practice of this method exemplified in finding the parallax of Mars.

PARALLAX, *to observe the Moon's.* Observe the moon's meridian altitude, with the greatest accuracy, and mark the moment of time: this time being equated (see EQUATION), compute her true longitude and latitude, and from these find her declination, and from her declination, and the elevation of the equator, find her true meridian altitude: if the observed altitude be not meridian, reduce it to the true altitude for the time of observation; take the refraction from the observed altitude, and subtract the remainder from the true altitude; and the remainder is the moon's parallax.

By this means Tycho, in 1583, Oct. d. 12 hor. 5. 19'. from the moon's meridian altitude observed, 13° 38', found her parallax to be 54 minutes.

To observe the Moon's PARALLAX in an Eclipse.—In an eclipse of the moon, observe when both horns are in the same vertical circle; in that moment take the altitudes of both horns; the difference of the two being halved, and added to the least, or subtracted from the greatest, gives nearly the visible altitude of the moon's centre: but the true altitude is nearly equal to the altitude of the centre of the shadow at that time. Now we know the altitude of the centre of the shadow, because we know the sun's place in the ecliptic, and its depression under the horizon, which is equal to the altitude of the opposite point of the ecliptic in which the centre of the shadow is: thus have we both the true and apparent altitude, the difference whereof is the parallax.

PARALLAX, *in order to find the Moon's.* Let a graduated instrument, as D A E (the larger the better), *Plate XVIII. Astronomy, fig. 8.* having a moveable index with sight-holes, be fixed in such a manner, that its plate surface may be parallel to the plane of the equator, and its edge A D in the meridian; so that when the moon is in the equinoctial, and on the meridian A D E, she may be seen through the sight-holes, when the edge of the moveable index cuts the beginning of the divisions at O, on the graduated limb D E; and when she is so seen, let the precise time be noted. Now, as the moon revolves about the earth from the meridian to the meridian again, in about 24 hours, 48 minutes, she will go a fourth part round it in 6 hours, 12 minutes, as seen from C, or from the earth's centre or pole. But as seen from A, the observer's place on the earth's surface, the moon will seem to have gone a quarter round the earth when she comes to the sensible horizon at O; for the index, through the sights of which she is then viewed, will be at *d*, 90° from D, where it was when she was seen at E. Now, let the exact moment when the moon is seen at O, in or near the sensible horizon, be carefully noted, (allowance being made for the horizontal refraction, which is about 34', so that the moon's centre will appear 34 minutes above the horizon, when her centre is really in it); that it may be known in what time she has gone from E to O; which time subtracted from 6 hours 12 minutes, (the time of her going from E to L), leaves the time of her going from O to L, and affords an easy method for finding the angle O A L, or the moon's horizontal

horizontal parallax, which is equal to the angle ALC , by the following analogy: as the time of the moon's describing the arc EO is to 90° , so is 6 hours 12 minutes to the degrees of the arc DdE , which measures the angle EAL ; from which subtract 90° , and there remains the angle $OAL = ALC$, under which the earth's semi-diameter AC is seen from the moon.

Astronomers have proposed the following method, for more accurately determining the moon's parallax; let two observers be placed under the same meridian, one in the northern hemisphere, and the other in the southern, at such a distance from each other, that the arc of the celestial meridian included between their two zeniths, may be at least 80 or 90 degrees. Let each observer take the distance of the moon's centre from his zenith, by means of an exceeding good instrument, at the moment of her passing the meridian: add these two zenith distances of the moon together, and their excess above the distance between the two zeniths, will be the distance between the two apparent places of the moon. Then as the sum of the natural sines of the two zenith distances of the moon is to the radius, so is the distance between her two apparent places to her horizontal parallax. If the two places be not exactly under the same meridian, their difference of longitude must be accurately taken, that proper allowance may be made for the moon's declination, while she is passing from the meridian of the one to the meridian of the other. Ferguson's Astr. p. 307. quarto, 1773.

Otherwise: take the meridian altitudes of the moon, when it is at its greatest north and south latitudes, and correct them for refraction: then the difference of the altitudes, thus corrected, would be equal to the sum of the two latitudes of the moon, if there were no parallax; consequently the difference between the sum of the two latitudes and the difference of the altitudes, will be the difference between the parallaxes at the two altitudes. To find from them the parallax itself, let S, s , be the sines of the greatest and least apparent zenith distances; P, p , the sines of the corresponding parallaxes: then as, when the distance is given, the parallax varies as the sine of the zenith distance, as we have shewn at the beginning of the article PARALLAX,

$$S : s :: P : p; \text{ hence } S - s : s :: P - p : p = \frac{s \times P - p}{S - s},$$

the parallax at the greatest altitude. This supposes that the moon is at the same distance in both cases; but as this will not necessarily happen, we must correct one of the observations, in order to reduce it to what it would have been, had the distance been the same, the parallax at the same altitude being inversely as the distance. If the observations be made in those places where the moon passes through the zenith of one of the observers, the difference between the sum of the two latitudes and the zenith distance at the other observation will be the parallax at that altitude.

Since, from the moon's theory, we have the ratio of her distances from the earth in the several degrees of her anomaly; those distances being found by the rule of three in semidiameters of the earth, the parallax is thence determined to the several degrees of the true anomaly.

De la Hire makes the greatest horizontal parallax $1^\circ 1' 25''$, the smallest $54' 5''$. The moon's distance, therefore, when in her perigee, is, according to his calculation, $55,197\frac{7}{8}$, that is, almost 56 semidiameters; in her apogee $63,107\frac{5}{8}$, that is, $63\frac{1}{2}$ semidiameters of the earth.

M. le Monnier determined the mean parallax of the moon to be $57' 12''$. Others have made it $57'.18''$.

According to the Tables of Mayer, the greatest parallax

of the moon (or when she is in her perigee and in opposition) is $61' 32''$; the least parallax (or when she is in her apogee and conjunction) is $53' 52''$, in the latitude of Paris: the arithmetical mean of these is $57' 42''$. But this is not the parallax at the mean distance, because the parallax varies inversely as the distance; and therefore the parallax at the mean distance is $57' 24''$, an harmonic mean between the two. M. de Lambre re-calculated the parallax from the same observations from which Mayer calculated it, and found it did not exactly agree with Mayer's. He made the equatorial parallax $57' 11''.4$ M. de la Lande makes it $57' 5''$ at the equator, $56' 53''.2$ at the pole, and $57' 1''$ for the mean radius of the earth, supposing the difference of the equatorial and polar diameters to be $\frac{1}{100}$ of the whole. From the formula of Mayer, the equatorial parallax is $57' 11''.4$.

From the Moon's PARALLAX AST, Plate XVIII. Astronomy, fig. 5, and Altitude SR , to find her Distance from the Earth. By her apparent altitude given, we have her apparent distance from the zenith, i. e. the angle ZAS ; or, by her true altitude, the angle ATS ; wherefore, since at the same time we have the parallactic angle S ; and the semi-diameter of the earth AT is reputed as 1; by plane trigonometry we shall have the moon's distance in semidiameters of the earth, thus: as the sine of the angle S is to the opposite side given, so is the sine of the other angle T to the side AS : or so is the sine of $TAS (= 180^\circ - T + S)$ to the side TS , the distance from the centre.

Hence, according to Tycho's observation, the moon's distance at that time from the earth was 62 semi-diameters of the earth.

Otherwise: for finding the mean distance, Cs (fig. 9.) of the moon, we have AC , the mean radius (r) of the earth: Cs , the mean distance (D) of the moon from the earth: $\sin. 57' 1'' = AsC : \sin. 90^\circ$ or radius :: $1 : 60.3$; consequently $D = 60.3 r$; but $r = 3964$ miles; and therefore $D = 239029$ miles. According to M. de la Lande, the horizontal semi-diameter of the moon: its horizontal parallax for the mean radius (r) of the earth :: $15' : 54' 57''.4$, or very nearly as $3 : 11$; hence, the semi-diameter

$$\text{of the moon is } \frac{3}{11} r = \frac{3}{11} \times 3964 = 1081 \text{ miles; and as}$$

the magnitudes of spherical bodies are as the cubes of their radii, we have the magnitudes of the moon and earth as $3^3 : 11^3 :: 27 : 1331 :: 1 : 49$ nearly. Vince, ubi supra.

Another Method of observing the Parallax of a celestial Body.—Let the body, P , (fig. 10.) be observed from two places, A and B , in the same meridian, then the whole angle APB is the sum of the parallaxes of the two places. The parallax $APC = \text{hor. par.} \times \sin. PAL$, (as appears in the beginning of this article,) taking APC for $\sin. APC$, and the parallax $BPC = \text{hor. par.} \times \sin. PBM$; hence $\text{hor. par.} \times \sin. PAL + \sin. PBM = APB$; therefore $\text{hor. par.} = APB$ divided by the sum of these two sines. If the two places be not in the same meridian, it does not signify, provided we know how much the altitude varies from the change of declination of the body, in the interval of the passages over the meridians of the two observers.

Ex. On October 5, 1751, M. de la Caille, at the Cape of Good Hope, observed Mars to be $1' 25''.8$ below the parallel of λ in Aquarius, and at the distance of 25° from the zenith. On the same day, at Stockholm, Mars was observed to be $1' 57''.7$ below the parallel of λ , and at $68^\circ 14'$ zenith distance. Hence the angle APB is $31''.9$, and the sines of the zenith distances being 0.4226 and 0.9287 ,

the horizontal parallax was $23''.6$. Hence, if the ratio of the distance of the earth from Mars to its distance from the sun be found, we shall have the sun's horizontal parallax, the horizontal parallaxes being inverfely as their distances from the earth.

To observe the PARALLAX of Mars.—1. Suppose Mars in the meridian and equator, in H, (*fig. 11.*) and that the observer, under the equator in A, observes him culminating with some fixed star. 2 If now the observer was in the centre of the earth, he would see Mars constantly in the fame point of the heavens with the star; and therefore, together with it, in the plane of the horizon, or of the sixth horary; but since Mars here has some sensible parallax, and the fixed star has none, Mars will be seen in the horizon, when in P, the plane of the sensible horizon; and the star, when in R, the plane of the true horizon: observe, therefore, the time between the transits of Mars and of the star through the plane of the sixth hour. 3. Convert this time into minutes of the equator; by this means we shall have the arc PM, to which the angle PAM, and consequently the angle AMD, is nearly equal; which is the horizontal parallax of Mars.

If the observer be not under the equator, but in a parallel IQ, that difference will be a less arc QM: wherefore, since the little arcs QM and PM are as their sines ID and AD; and since ADG is equal to the distance of the place from the equator, *i. e.* to the elevation of the pole; and therefore AD to ID, as the whole sine to the co-sine of the elevation of the pole; say, as the co-sine of the elevation of the pole ID is to the whole sine AD; so is the parallax observed in I, to the parallax to be observed under the equator.

Since Mars and the fixed star cannot be commodiously observed in the horizon; let them be observed in the circle of the third hour: and since the parallax there observed, TO, is to the horizontal one PM, as IS to ID; say, as the sine of the angle IDS, or 45° , (since the plane DO is in the middle between the meridian DH and the true horizon DM.) is to the whole sine; so is the parallax TO to the horizontal parallax PM.

If Mars be likewise out of the plane of the equator, the parallax found will be an arc of a parallel; which must, therefore, be reduced, as above, to an arc of the equator.

Lastly, if Mars be not stationary, but rather direct, or retrograde, by observations for several days; find out what his motion is every hour, that his true place from the centre may be assigned for any given time.

By this method Cassini, to whom we owe this noble invention, observed the greatest horizontal parallax of Mars to be twenty-five seconds, or a little less: but, by the same method, Mr. Flamsteed found it near thirty seconds. By the same method, the same author, Cassini, observed also the parallax of Venus.

It must be here noted, that the observation is to be made with a telescope, in whose focus are strained four threads, cutting each other at right angles, A, B, C, D, *fig. 12*, and the telescope is to be turned about, till some star near Mars be seen to pass over some of the threads, that the threads AB and CD may be parallel to the equator, and therefore AC and BD may represent circles of declination: thus, by means of the perpendicular threads, the situations of the star, and of Mars, in the meridian, and circle of three o'clock, will be determined.

Another Method of finding the Parallax of a celestial Body. Let EQ be the equator (*fig. 13.*), P its pole, Z the zenith, v the true place of the body, and r the apparent place, as depressed by parallax in the vertical circle ZK,

and draw the secondaries, Pva , Prb ; then ab is the parallax in right ascension, and rs in declination. Now,

$$vr : vs :: 1 \text{ (rad.)} : \sin. vrs, \text{ or } ZvP$$

$$vs : ab :: \text{cof. } va : 1 \text{ (rad.)}$$

$$\therefore vr : ab :: \text{cof. } va : \sin. ZvP;$$

therefore $ab = \frac{vr \times \sin. ZvP}{\text{cof. } va}$; but $vr = \text{hor. par.} \times$

$\sin. vZ$, and $\sin. vZ : \sin. ZP :: \sin. ZPv : \sin. ZvP =$
 $\frac{\sin. ZP \times \sin. ZPv}{\sin. vZ}$; therefore, by substitution, $ab =$

$\frac{\text{hor. par.} \times \sin. ZP \times \sin. ZPv}{\text{cof. } va}$. Hence, for the same

star, where the hor. par is given, the parallax in right ascension varies as the sine of the hour angle. Also, the hor. par.

$= \frac{ab \times \text{cof. } va}{\sin. ZP \times \sin. ZPv}$. For the eastern hemisphere, the

apparent place, b , lies on the equator to the east of a , the true place, and therefore the right ascension is increased by parallax; but in the western hemisphere, b lies to the west of a , and therefore the right ascension is diminished. Hence, if the right ascension be taken before and after the meridian, the whole change of parallax in right ascension between the two observations, is the sum (s) of the two parts before and

after the meridian, and the hor. par. $= \frac{s \times \text{cof. } va}{\sin. ZP \times S}$. On

the meridian there is no parallax in right ascension, for $ab =$
 $\frac{vr \times \sin. ZvP}{\text{cof. } va}$, and on the meridian, the angle ZvP , and

consequently its sine, vanishes.

To apply this rule, observe the right ascension of the planet when it passes the meridian, compared with that of a fixed star, at which time there is no parallax in right ascension; about six hours after, take the difference of their right ascensions again, and observe how much the difference, d , between the apparent right ascensions of the planet and fixed star has changed in that time. Next, observe the right ascension of the planet for three or four days when it passes the meridian, in order to get its true motion in right ascension; then, if its motion in right ascension, in the above interval of time, between the taking of the right ascensions of the fixed star and planet on and off the meridian, be equal to d , the planet has no parallax in right ascension; but if it be not equal to d , the difference is the parallax in right ascension; and hence the horizontal parallax will be known. Or one observation may be made before the planet comes to the meridian, and one after, by which a greater difference will be obtained.

Ex. On Aug. 15, 1719, Mars was very near a star of the fifth magnitude, in the eastern shoulder of Aquarius; and at $9^h 18'$ in the evening, Mars followed the star in $10' 17''$; and on the 16th, at $4^h 21'$ in the morning, it followed it in $10' 1''$; therefore, in that interval, the apparent right ascension of Mars had increased $16''$ in time. But, according to observations made in the meridian for several days after, it appeared that Mars approached the star only $14''$ in that time, from its motion; therefore $2''$ in time, or $30''$ in motion, is the effect of parallax in the interval of the observations. Now the declination of Mars was 15° , the co-latitude $41^\circ 10'$, and the two hour angles $49' 15''$, and $56' 39''$;

therefore the hor. par. $= \frac{30'' \times \text{cof. } 15^\circ}{\sin. 41^\circ 10' \times \sin. 49^\circ 15' + \sin. 56^\circ 39'}$
 $= 27\frac{1}{2}''$. But at that time, the distance of the earth from Mars

PARALLAX.

Mars was to its distance from the sun, as 37 to 100; and therefore, the sun's horizontal parallax comes out 10".17.

Besides the effect of parallax in right ascension and declination, it is manifest that the latitude and longitude of the moon and planets must also be affected by it; and as the determination of this, in respect to the moon, is in many cases, particularly in solar eclipses, of great importance, we shall proceed to shew how to compute it, supposing that we have given the latitude of the place, the time, and consequently the sun's right ascension, the moon's true latitude and longitude, with her horizontal parallax.

Let H Z R (fig. 14.) be the meridian, φ E Q the equator, p its pole; φ C the ecliptic, P its pole; φ the first point of Aries, H Q R the horizon, Z the zenith, Z L a secondary to the horizon passing through the true place r , and apparent place, t , of the moon; draw P t, P r, which produce to s , drawing the small circle ts , parallel to ov ; then rs is the parallax in latitude, and ov the parallax in longitude. Draw the great circles, φ P, P Z A B, P p d e, and Z W, perpendicular to pe ; then, as φ P = 90° , and φp = 90° , φ must be the pole of P p d e, and therefore $d \varphi$ = 90° ; consequently d is one of the solstitial points, \oplus or \ominus ; also, draw Z x perpendicular to P r, and join Z φ , $p \varphi$. Now φ E, or the angle φp E, or Z p φ , is the right ascension of the mid-heaven, which is known; P Z = A B (because A Z is the complement of both) the altitude of the highest point, A, of the ecliptic above the horizon, called the nonagesimal degree, and φ A, or the angle φ P A, is its longitude; also, Z p is the co-latitude of the place, and the angle Z p W is the difference between the right ascension of the mid-heaven φp E, and φ E. Now, in the right-angled triangle Z p W, rad. \times cof. p = tan. p W \times cot. p Z; therefore,

$$\log. \tan. p W = 10, + \log. \text{cof. } p - \log. \text{cot. } p Z;$$

hence, P W = $p W \pm p P$, where the upper sign takes place when the right ascension of the mid-heaven is less than 180° ; and the lower sign, when greater. Also, in the triangles W Z p, W Z P, we have fin. W p : fin. W P :: tan. W P Z : tan. W p z :: cot. W p Z : cot. W P Z, or, tan. A P φ ; therefore,

$$\log. \tan. A P \varphi = \text{ar. co. log. fin. W p} + \log. \text{fin. W P} + \log. \text{cot. W p Z} - 10;$$

and as we know φ o, or φ P o, the true longitude of the moon, we know A P o, or Z P x. Also, in the triangle W P Z, we have cof. W P Z, or fin. A P φ , : rad. :: tan. W P : tan. Z P; therefore,

$$\log. \tan. Z P = 10, + \log. \tan. W P - \log. \text{fin. A P } \varphi.$$

Again, in the triangle Z P r, we know Z P, P r, and the angle, P, from which the angle Z r P, or $t r s$, may be thus found. In the right-angled triangle Z P x, we know Z P, and the angle P; hence, rad. \times cof. Z P x = cot. P Z \times tan. P x; therefore,

$$\log. \tan. P x = 10, + \text{cof. Z P x} - \log. \text{cot. P Z};$$

therefore we know r x; hence, fin. r x : fin. P x :: tan. Z P x : tan. Z r x, or $t r s$; therefore,

$$\log. \tan. Z r x = \text{ar. co. log. fin. r x} + \log. \text{fin. P x} + \log. \text{tan. Z P x} - 10;$$

also, in the right-angled triangle Z r x, we have rad. \times cof. Z r x = cot. Z r \times tan. r z; therefore,

$$\log. \text{cot. Z r} = 10, + \log. \text{cof. Z r x} - \log. \text{tan. r x}.$$

With this true zenith distance Z r, find the parallax, as if it were the apparent zenith distance, and it will give you the true parallax nearly; add this, therefore, to the true zenith

distance, and you will get nearly the apparent zenith distance, to which compute again the parallax, and thus you will get the true parallax, r t, extremely nearly; then, in the right-angled triangle r s t, which may be considered as plane, we have rad. : cof. r :: r t : r s, the parallax in latitude; therefore,

$$\log. r s = \log. r t + \log. \text{cof. r} - 10, = \log. \text{par. latitude}.$$

Also, rad. : fin. r :: r t : t s; therefore,

$$\log. t s = \log. r t + \log. \text{fin. r} - 10,$$

hence, cof. t v : rad. :: t s : o v, the parallax in longitude, therefore,

$$\log. o v = 10, + \log. t s - \log. \text{cof. t v} = \log. \text{par. long.}$$

Ex. On January 1, 1771, at 9^h apparent time, in lat 53° N., the moon's true longitude was $3^\circ 18' 27'' 35''$, and latitude $4^\circ 5' 30''$ S., and its horizontal parallax $61' 9''$; to find its parallax in latitude and longitude.

The sun's right ascension was $282^\circ 22' 2''$ by the Tables, and its distance from the meridian 135° ; also, the right ascension φ E, of the mid-heaven, was $57^\circ 22' 2''$; hence, the whole operation for the solution of the triangles will stand thus:

Tri. Z p W	Z p W = $32^\circ 37' 58''$	-	10, + cof.	19.9253864
	Z p = $37^\circ 0' 0''$	-	-	cot. 10.1228856
	p W = $32^\circ 23' 57''$	-	-	tan. 9.8025008
	P p = $23^\circ 28' 0''$			
	P W = $55^\circ 51' 57''$			
Tri. W p Z, W P Z	p W = $32^\circ 23' 57''$	-	ar. co. fin.	0.2709855
	P W = $55^\circ 51' 57''$	-	-	fin. 9.9178865
	Z p W = $32^\circ 37' 58''$	-	-	cot. 10.1935941
	A P φ = $67^\circ 29' 8''$	-	-	tan. 10.3824661
	o P φ = $108^\circ 27' 35''$			
	o P A = $40^\circ 58' 27''$			
Tri. W P Z	W P = $55^\circ 51' 57''$	-	10, + tan.	20.1688210
	A P φ = $67^\circ 29' 8''$	-	-	fin. 9.9655700
	Z P = $57^\circ 56' 36''$	-	-	tan. 10.2032510
Tri. Z P x	Z P x = $40^\circ 58' 27''$	-	10, + cof.	19.8779500
	Z P = $57^\circ 56' 36''$	-	-	cot. 9.7967445
	P x = $50^\circ 19' 33''$	-	-	tan. 10.0812055
	P r = $94^\circ 5' 30''$			
Tri. Z P x, Z r x	r x = $43^\circ 45' 57''$	-	ar. co. fin.	0.1600743
	P x = $50^\circ 19' 33''$	-	-	fin. 9.8863144
	Z P x = $40^\circ 58' 27''$	-	-	tan. 9.9387676
	Z r x = $44^\circ 1' 16''$	-	-	tan. 9.9851563
Tri. Z r x	Z r x = $44^\circ 1' 16''$	-	10 + cof.	19.8567795
	r x = $43^\circ 45' 57''$	-	-	tan. 9.9812846
	Z r = $53^\circ 6' 10''$	-	-	cot. 9.8754949
	Z r = $53^\circ 6' 10''$	-	-	fin. 9.9029362

PARALLAX.

Brought over	-	fin.	9.9029362
Hor. par. = 61' 9" = 3669"	-	log.	3.5645477
<hr/>			
<i>rt</i> uncorrected = 2934" = 48' 54"		log.	3.4674839
<hr/>			
App. zen. dist. <i>Zt</i> = 53' 55" 4" nearly,		fin.	9.9075042
Hor. par. = 61' 9" = 3669"	-	log.	3.5645477
<hr/>			
Tri. <i>trs</i> {	Par. <i>rt</i> cor. = 2965" = 49' 25"	log.	3.4720519
	<i>trs</i> = 44° 1' 16"	col.	9.8567795
	<hr/>		
	<i>rs</i> par. in lat. = 2132" = 35' 32"	log.	3.3288314
<hr/>			
Tri. <i>trs</i> {	<i>rt</i> cor. = 2965"	log.	3.4720519
	<i>trs</i> = 44° 1' 16"	fin.	9.8419369
	<hr/>		
	<i>ts</i> = 2061" = 34' 21"	log.	3.3139888
	True lat. <i>ro</i> = 4° 5' 30"		
App. lat. <i>tv</i> = <i>ro</i> + <i>rs</i> = 4° 41' 2"	col.	9.9985472	
<i>ts</i> = 2061"	10, + log.	13.3139888	
<hr/>			
	<i>ov</i> par. in long. = 2067" = 34' 27"	log.	3.3154416

The value of *tv* is *ro* - or + *rs*, according as the moon has N. or S. latitude.

The order of the signs being from west to east, from A towards C is eastward, and from A towards φ is westward: now the parallax depressing the body from *r* to *t*, increases the longitude from *o* to *v*; but if the point *o* had been on the other side of A, *ov* would have lain the contrary way; hence, when the body is to the east of the nonagesimal degree, the parallax increases the longitude; and when it is to the west, it diminishes the longitude. Vince, ubi supra.

PARALLAX, To find the Sun's. — The great distance of the sun renders its parallax too small to fall under even the nicest immediate observation; indeed, many attempts have been made, both by the ancients and moderns, and many methods invented for that purpose. The first was that of Hipparchus, followed by Ptolemy, who made the sun's horizontal parallax 2' 50", and Tycho, who made it 3', &c.; this was founded on the observation of lunar eclipses: the second was that of Aristarchus, whereby the angle subtended by the semidiameter of the moon's orbit, seen from the sun, was sought from the lunar phases: but these both proving deficient, astronomers are now forced to have recourse to the parallaxes of the planets nearer us, as Mars and Venus; for, from their parallaxes known, that of the sun, which is inaccessible by any direct observation, is easily deduced. For, from the theory of the motions of the earth and planets, we know, at any time, the proportion of the distances of the sun and planets from us; and the horizontal parallaxes are in a reciprocal proportion to those distances: knowing, therefore, the parallax of a planet, that of the sun may be found from it.

Thus Mars, when opposite to the sun, is twice as near as the sun is: his parallax, therefore, will be twice as great as that of the sun; and Venus, when in her inferior conjunction with the sun, is sometimes nearer us than he is; her parallax, therefore, is greater in the same proportion. Thus, from the parallaxes of Mars and Venus, Cassini found the sun's parallax to be ten seconds; which implies his distance to be 22,000 semidiameters of the earth.

The most accurate method of determining the parallaxes of these planets, and deducing from thence the true parallax of the sun is, that of observing their transit: however, Mercury, though frequently to be seen on the sun, is not fit for this purpose; because it is so near the sun, that the

difference of their parallaxes is always less than the solar parallax required. But the parallax of Venus, being almost four times as great as the solar parallax, will cause very sensible differences between the times in which she will seem to be passing over the sun at different parts of the earth. With a view of engaging the attention of astronomers to this method of determining the sun's parallax, Dr. Halley communicated to the Royal Society in 1691, a paper containing an account of the several years in which such a transit may happen, computed from the tables which were then in use: those at the ascending node occur in the month of November, O. S. in the years 918, 1161, 1396, 1631, 1639, 1874, 2109, 2117: and at the descending node in May, O. S. in the years 1048, 1283, 1291, 1518, 1526, 1761, 1769, 1996, 2004. Phil. Transf. Abr. vol. i. p. 435, &c.

Dr. Halley even then concluded, that if the interval in time between the two interior contacts of Venus with the sun could be measured to the exactness of a second, in two places properly situated, the sun's parallax might be determined within its 500th part. But this conclusion was explained more fully in a subsequent paper, (Phil. Transf. N^o 348, or Abr. vol. iv. p. 213.) concerning the transit of Venus in the year 1761. It does not appear that any of the preceding transits had been observed; except that of 1639, by our illustrious countryman Mr. Horrox, and his friend Mr. Crabtree, of Manchester. But Mr. Horrox died on the 3d of January, 1640—1, about the age of twenty-five, just after he had finished his treatise, intitled "Venus in Sole Visa," in which he discovered a more accurate knowledge of the dimensions of the solar system than his learned commentator Hevelius.

In order to give our readers, not much conversant with subjects of this kind, a general idea of this method of determining the horizontal parallax of Venus, and from thence, by analogy, the parallax and distance of the sun, and of all the planets from him; it may be briefly illustrated in the following manner: let DBA, (Plate XVIII. Astronomy. fig. 15.) be the earth, V, Venus, and T S R the eastern limb of the sun. To an observer at B the point *t* of that limb will be on the meridian, its place referred to the heaven will be at E, and Venus will appear just within it at S. But, at the same instant, to an observer at A, Venus is east of the sun, in the right line A V F; the point *t* of the sun's limb appears at *e* in the heavens, and if Venus were then visible, she would appear at F. The angle C V A is the horizontal parallax of Venus; and is equal to the opposite angle F V E, measured by the arc FE. A S C is the sun's horizontal parallax, equal to the opposite angle e S E, measured by the arc e E; and F A e, or V A v, is Venus's horizontal parallax from the sun, which may be found by observing how much later in absolute time her total ingrefs on the sun is, as seen from A, than as seen from B, which is the time she takes to move from V to v, in her orbit O V v. If Venus were nearer the earth, as at U, her horizontal parallax from the sun would be the arc f e, which measures the angle f A e; and this angle is greater than the angle F A e, by the difference of their measures f F. So that as the distance of the celestial object from the earth is less, its parallax is the greater. Now it has been already observed, that the horizontal parallaxes of the planets are inversely as their distances from the earth's centre; therefore as the sun's distance at the time of the transit is to Venus's distance, so is her horizontal parallax to that of the sun: and as the sun's mean distance from the earth's centre is to his distance on the day of the transit, so is his horizontal parallax on that day to his horizontal parallax at the time of his mean distance from the earth's centre

centre. Hence his true distance in semidiameters of the earth may be obtained by the following analogy: as the sine of the sun's parallax is to radius, so is unity or the earth's semidiameter to the number of semidiameters of the earth in the sun's distance from the centre; which number multiplied by 3985, the number of miles in the earth's semidiameter, will give the number of miles in the sun's distance. Then from the proportional distances of the planets, determined by the theory of gravity (see DISTANCE), we may find their true distances. And from their apparent diameters at these known distances, their real diameters and bulks may be found. See PLANETS.

Mr. Short, with great labour, deduced the quantity of the sun's parallax from the best observations that were made of the transit of June 6th, 1761, (for which see Phil. Transf. vol. li. and lii.) both in Britain and abroad, and found it to have been $8''.52$ on the day of the transit, when the sun was very nearly at his greatest distance from the earth; and, consequently, $8''.65$ when the sun is at his mean distance from the earth. (See Phil. Transf. vol. lii. art. 100. p. 611, &c.) Whence we shall have radius, or $10.0000000 - 5.621914$, or sine of $8''.65$ taken out of Gardiner's tables = 4.3780860 , the logarithm of the number 23882.84 , or the number of semidiameters of the earth contained in its distance from the sun: and multiplying 23882.84 by 3985 , the number of English miles contained in the earth's semidiameter, we shall have $95,173,127$ miles for the earth's mean distance from the sun. And from the analogies under the article DISTANCE, we shall find the mean distances of all the rest of the planets from the sun in miles to be as follows, viz. Mercury's distance, $36,841,468$; Venus's distance, $68,891,486$; Mars's distance, $145,014,148$; Jupiter's distance, $494,990,976$; and Saturn's distance, $907,956,130$. In another paper, (Phil. Transf. vol. liii. p. 169.) Mr. Short states the mean horizontal parallax of the sun at $8''.69$. Mr. Hornsby, from several observations of the transit of June 3d, 1769, (for which see Phil. Transf. vol. lix. &c.) deduces the sun's parallax for that day equal to $8''.65$, and the mean parallax $8''.78$, whence he makes the mean distance of the earth from the sun to be $93,726,900$ English miles; Mercury's distance, $36,281,700$; Venus's distance, $67,795,500$; Mars's distance, $142,818,000$; Jupiter's distance, $487,472,000$; and Saturn's distance, $894,162,000$ miles. (Phil. Transf. vol. lxi. part ii. p. 579.) Others, however, by taking the results of those observations that were most to be depended on, have made the sun's parallax at his mean distance from the earth to be $8''.6045$; and others again make it $8''.54$. According to the former of these, the sun's mean distance from the earth is $95,109,736$ miles; and, according to the latter, it is $95,834,742$ miles. Upon the whole, there seems reason to conclude, that it may be fairly reckoned at more than ninety-five millions of miles, and less than ninety-six. Ferguson's Astr. p. 354. See PLANETS.

The PARALLAX of the Stars, with regard to the Earth's natural Orbit; called their annual parallax. The stars have no parallax, with regard to the earth's semidiameter; yet, with regard to the earth's annual orbit, it is justly expected, that some parallax may be found.

The axis of the earth, in its natural motion, describes a kind of cylinder, which, being prolonged to the heaven of the fixed stars, there draws a circular circumference; each point of which is the pole of the world for its respective day: so that the situation of the apparent pole, with regard to any of the fixed stars, changes very considerably in the course of a year.

Could this be found by observation, it would irrefragably evince the annual motion of the earth round the sun, and remove that only objection which lies against it, urged by Ricciolus, from no such parallax being observed.

Accordingly, Dr. Hook attempted to find it by observing the various distances of a fixed star from the zenith, in different parts of the earth's orbit; and Mr. Flamsteed, from the access and recess of a fixed star from the equator at different times of the year, and with imagined success; the result of his observations being, that a fixed star, near the pole, was found 40 or 45 seconds nearer it at the winter solstice, than at the summer one, for seven years successively.

Mr. Cassini the younger allows the observations of Flamsteed to agree with those made at the Royal Observatory; but he denies the consequences: he says that the variations in the distance of the pole-star are not such as they should be, supposing the motion of the earth. Fontenelle accounts for them from a supposition, that the stars, like the sun, turn or revolve on their centres; and that some of them have their hemispheres equally luminous: whence, when the more shining hemisphere is turned towards us, the stars appear bigger, consequently nearer the neighbouring stars, than when the darker is towards us.

Dr. Bradley has accounted for this supposed parallax in another way; and conceives it to proceed from the progressive motion of the star's light. (See Motion of the EARTH and LIGHT.) For the result of later observations, see STARS.

PARALLAX is also used, in Levelling, for the angle contained between the line of true level, and that of apparent level.

PARALLAXIS, among Medical Writers, expresses a natural change in the situation of the parts of a broken bone, as when the two fragments slip to the sides of one another.

PARALLEL, in Geometry, is applied to lines, figures, and bodies, which are every where equidistant from each other; or which, though infinitely produced, would never either approach nearer, or recede farther from, each other.

PARALLEL Right Lines, are those which, though infinitely produced in the same plane surface, would never meet.

Thus the line O P, (Plate X. Geometry, fig. 10.) is parallel to Q R.

Parallel lines stand opposed to lines converging, and diverging.

Some define an inclining or converging line that which will meet another at a finite distance; and a parallel line, that which will only meet it at an infinite distance.

A perpendicular is by some said to be the shortest of all lines that can be drawn to another; and a parallel the longest.

Geometricians demonstrate, that two right lines, perpendicular to one and the same right line, are parallel to each other, and hence they infer the possibility of parallel lines: that perpendiculars to one of two parallel lines, terminated by those lines, are equal to each other, and also perpendicular to the other of the two parallels: that two lines, parallel to the same third line, are also parallel to one another; and that if two parallels, O P and Q R, be cut by a transverse line S T in A and B; 1. The alternate angles x and y are equal: 2. The external angle u is equal to the internal opposite one y : 3. That a line intersecting two parallel lines, make the angles on the same side equal to each other: and,

4. That

PARALLEL MOTION.

4. That the two internal opposite ones, z and y , are also equal to two right ones.

It is shewn, on the principles of optics, that if the eye be placed between two parallel lines, they will appear to converge towards a point opposite to the eye, because the apparent magnitudes of their perpendicular intervals are perpetually diminished; for the same reason they appear to converge towards an imaginary line, drawn parallel to them from the eye: and if they run to such a length, as that the distance between them be but as a point thereto, they will there appear to coincide.

This is the reason that the remoter parts of a walk or floor appear to ascend gradually, and the ceiling to descend towards the horizontal line; and that the surface of the sea, seen from an eminence, appears to ascend gradually in going from the shore; and that the upper parts of very high buildings seem to lean forward over the eye below.

Parallel lines are described by letting fall equal perpendiculars, and drawing lines through their extremes, by sliding the compasses open to the desired width, along a line, &c. or, by drawing two lines, which shall make the alternate angles with a line intersecting them equal.

Parallel Motion, is a term used among practical mechanics to denote the rectilinear motion of a piston-rod, &c. in the direction of its length; and contrivances, by which such alternate rectilinear motions are converted into continuous rotatory ones, or *vice versa*; for pumps, steam-engines, saw-mills, &c. are usually called parallel motions, or parallel levers. In the modern improved steam-engines and pumps, close cylinders are generally used for the pistons to act in, which being worked by polished rods sliding through collars or stuffing-boxes in the lids of the cylinders, it has become necessary to contrive methods for causing the piston-rod to move accurately up and down in the same right line. The different combinations of levers used to produce this effect are worthy of our notice, as exhibiting some ingenious applications of geometrical principles. The object of the parallel motion is, to convert the motion of the end of a reciprocating beam or lever, into a vertical or rectilinear motion; or the continuous motion of a crank at once into a reciprocating motion.

The simplest and most obvious method of producing either of these effects, is to connect the end of the piston-rod to the beam, or the crank, by means of joints, with a connecting rod of a proper length between them, and confine the former, to preserve its rectilinear movement, by sliding through a collar, or in grooves. Friction-wheels may be used to make it work easily; but in machines which have great strains, the constant wear of the grooves or wheels would soon produce looseness, and destroy the parallelism of the motion: recourse must, therefore, be had to parallel levers.

Plate III. of Steam-engines, contains three different constructions of levers, which are in common use in steam-engines, to produce parallel motions. Two of them, *figs. 1, 2, 3, and 4*, were, we believe, first introduced by Messrs. Boulton and Watt, as appendages to their patent steam-engine, in lieu of the sectors, or arch heads with chains, formerly applied to the beams of the old atmosphere engines. The most simple of these two is represented in *figs. 3 and 4*, where the pump, or piston-rod T , is required to move always in the line $T T$, when actuated by the beam, or lever, $H B$, whose centre of motion is A , and the point I , from which the rod receives its motion, of course moves in an arc of a circle. To this point, one end of a bar, or link $I K$, of any convenient length, is joined, and to the opposite end, K , the

extremity of a lever, $K L$, is attached by the joint or centre-pin K , the other end, L , moving on a fixed centre of motion. The lever, $K L$, is exactly equal in length to the acting radius, $A I$, of the beam, and its centre of motion, L , is attached to a fixed support, so situated, that when the beam, $A I$, is horizontal, or at right angles to the line $T T$, the lever, $K L$, will also be horizontal, and therefore parallel to $A I$; at the same time the link, $I K$, which connects them, must hang perpendicular. A centre-pin is fixed at M , exactly in the middle of $I K$, and to this centre the top of the piston-rod, T , is attached. Now the effect of the combination is, that the point, M , will always move in the vertical line $T T$, when the beam or the point, I , describes an arc of a circle round the centre A ; for it is evident, that when the levers, by the motion of the beam on its centre, are brought into the position shewn by the dotted lines A, I, K, L , (*fig. 3.*) either above or below the horizontal, the upper end of the link, $I K$, is drawn as much out of the line, $T T$, on one side, by the curved motion, or sweep of the beam, as the lower end is drawn out of that line, on the opposite side, by the sweep of the lever $K L$; consequently, its middle point, M , continues always in that line, and prevents the piston-rod deviating from it. The movement may be readily traced by inspection of the diagram, *fig. 3*, which exhibits the levers in three different positions.

Figs. 1 and 2 represent another of Boulton and Watt's parallel motions, and is that now most commonly used by themselves and other engine-makers. This, as before described, has two fixed centres, A and F , and rods connected by moveable joints C, B, D and E , forming a parallelogram.

In setting out of these centres, the line $G G$, in which the piston is to move, should fall as much short of the end of the beam, or point B , when in the horizontal position, as it will be beyond the end of the same at the two extremes of the movement, which positions are represented by dotted lines, *fig. 1*: the link, $B D$, connects the end of the beam with the top of the piston-rod, and about half way to the centre of the beam, another link, $C E$, of the same length, is joined, being always kept parallel to the former by a connecting rod, $D E$, which is equal in length to $C B$, so that $C B, D E$, may form a parallelogram, in whatever position it may be placed by the motion of the beam, and the consequent motion of the links and coupling-rod on their moveable centres.

The parallelism of the point, D , is produced by means of the lever, $E F$, which is connected to the point, E , of the parallelogram, and the other end moves on the fixed centre, F ; therefore the end, E , of the rod, $E D$, moves in an arc of a circle, round the centre F ; the other end, D , will be found to traverse the right line $G G$.

The proportions of the levers of this motion admit of great variation: the simplest case is, when the radius, $A C$, is exactly half of $A B$, then $E F$ must be equal to $A C$ or $C B$. Considerable latitude is allowed to the workman in the length of the links $B D$ and $C E$, without sensibly deranging the parallelism of the point D , and piston-rod attached to it. With these proportions, the centre, F , will fall upon the line $G G$, which is often inconvenient; for as there are two of the parallelograms, $C E$ and $D B$, one on each side of the beam, the centres of the lever, $E F$, cannot be made on one common axis. Eleven different proportions for these levers will appear by the following table of dimensions, in inches, taken from some of the best steam-engines, by various makers in or near the metropolis.

Figs.

PARALLEL MOTION.

Figs. 1 and 2.	Length of Stroke D d.	Beam A B.	Coupling Rod, D E C B.	Link, C E = B D.	Bridle = Lever E F
N 1	96	147	69	42	78
2	72	120	50	28	96
3	72	110	55	31½	55
4	48	90	41	20	60
5	48	84	38	19	60
6	48	84	36	20	54
7	48	72	41	18	25
8	45.6	76	40	28	36
9	36	60	37	12	15.66
10	24	37	16	9	26
11	23	36	16	12	26

The principle on which parallel motion, or what is insensibly near to one, is produced in all these different cases, will best appear, after explaining a different construction for the same purpose by Mr. Freemantle.

Fig. 6. represents this parallel motion, which is effected by means of two fixed centres, D and E. and the three moveable ones B, C and A. In this case the beam-centre, A, is not stationary, but has a small motion on its support D A, which is moveable on the fixed centre D: the centre C, which unites the lever, E C, to the beam, is in the middle of the beam, (*i. e.* BC = CA, and E C is also of the same length,) the support, D A, being of any convenient length; but the longer the better, since the construction requires, in strictness, that the point, A, should slide horizontally in the dotted lines E, A, instead of descending in each end of its course in the arc of the radius D A. The piston-rod, G, is jointed immediately to the end of the beam at B. The parallelism of the motion in this contrivance is effected by the lever, E C, compelling the middle point of the beam, A B, to move upon the arc C C, as it librates upon its centre, whilst that point traverses upon the top of the bar, A D, to such an extent, that the extremity, B, will always traverse upon the line G G, and of course carry the piston-rod with it. This may be demonstrated thus: supposing E A to be a horizontal line, let the dotted line, B A, represent any position whatever of the beam, and E C the corresponding position of the lever; then B C E and A C E will form two isosceles triangles, because of the equal sides B C and C E, and E C and C A: their opposite angles are equal, as E B C = B E C, and C E A = C A E; and because the angle, B E A, is made up of the angles B E C and C E A, the same, (B E A,) is equal to the sum of the two angles, B and A, of the triangle B A E, which shew the third angle, E, to be a right angle; therefore the point, B, will be perpendicular over E, or perpendicular beneath it, as a similar construction, below the line E A, would shew. As the demonstration is equally true of every other part of the movement, as well as its extremes, the angle, B E A, will in all cases be a right angle, and consequently produce a parallel motion. We have here supposed the centre, A, to be confined to slide along the line E A; but in practice it has been found, that the point, A, may be allowed to move in the arc of a circle, described on the centre D, instead of the right line E A, without producing sensible deviation in the parallelism of the point B, and the piston-rod, G, attached to it. The fixed centre, E, may also be moved out of the line B B, either towards or from the centre A, within certain limits, making proportionate alteration in the lengths of the lever E C, and radius A C, as will be evident on making the fol-

lowing comparison between the constructions in fig. 2. and fig. 6. If in figs. 1. and 2. we produce the line D E, and from A draw a line parallel to C E and B D, intersecting it in Y, then suppose the figures turned upside down, and end for end, we can compare the fixed centre D, fig. 6, with A, fig. 2; and the fixed centre E, fig. 6, with F; also the beam A B, fig. 6, with the produced coupling rod Y D; the support D A, fig. 6, with A Y; and the lever E C, fig. 6, with F E: it will then appear that the two constructions are essentially the same in principle, supposing the fixed centre, E, moved out beyond the line B B, as has been mentioned above to be practicable.

The dimensions, given in our table above, will shew what considerable variations in the proportion of lengths, particularly with regard to the lever E F, fig. 2, may be made in practice, without sensibly impairing this admirable contrivance for producing a vertical motion from a power moving up and down, in the arc of a circle described by the end of the beam.

A very ingenious parallel motion is represented in fig. 5, which converts the rectilinear motion of a piston-rod at once to a rotatory motion for a crank or axis. This contrivance has been ascribed to an American, named White; and has been adopted in steam-engines by Mr. Murray, of Leeds. It is founded on a well-known property of epicycloidal curves, *viz.* that if within any given fixed circle another circle rolls round, which is just half the diameter of the fixed circle, any point in the circumference of the rolling circle describes a right line, which crosses the longer circle, as a diameter thereto. The mode of construction is easily understood from the figure, in which A B is a fixed circle, or hoop of cast iron, whose internal diameter is equal to the stroke of the piston; it is supported externally by standards G and H, and furnished with small teeth all round the interior part of its circumference; C is a toothed wheel, whose diameter is only half that of the ring; the axis of the wheel, which is to have the rotatory motion, passes through the centre of the ring, and has a circular iron plate, or wheel E, fixed upon the extremity of it; from this plate, a pin or bolt, R, projects, and is by the motion of the axis carried round in a circle, in the manner of a crank. This pin forms the centre-pin of the small wheel C, and therefore compels it to roll round within the great circle, and keep the teeth always in contact. The upper extremity of the piston-rod is attached to a pin, F, fixed on the circumference of the small wheel, at the point where the two wheels will be in contact, when at the lowest and highest points of the motion.

The pin F, at the circumference of the small wheel, is adjustable by a slider and screw, so as exactly to suit the diameter of the outer circle; and the piston-rod, being attached to it, is moved truly up and down in the line I K, in a very regular manner, when the axis of the plate, E, is turned round; or *vice versa*, if the impelling power is applied to the piston-rod, in which case a fly-wheel must be applied upon the central axis to regulate the motion.

The extremity of the piston-rod will be confined to move in the vertical diameter of the ring, because it is made to describe an epicycloid of that kind, which is formed by a circle rolling round within the inside of another circle of double diameter, in which case, it is well known the epicycloid becomes a diameter of the larger circle, and the smaller circle makes two complete revolutions, while it is revolving from any one point of the larger circle to the same point again.

In all the motions we have described, the conversion of the reciprocating motion to a rotative, is effected by means

of a crank, which communicates with the beam by a connecting rod at the opposite end of the beam, in the manner of H K, *fig. 4*; usually at the end opposite to the parallel levers. Some mechanics have supposed it desirable, in a parallel motion, to give the piston-rod, the saw, or the like, an uniform velocity through the whole of its progress; then to bring it at once to rest again, and to give it instantaneously its intended velocity in the opposite direction, and so on. This the crank will not do, as its motion, at the point where the change or reciprocation of motion takes place, is imperceptible; they have therefore sought other means.

One method of producing this effect is, to make the piston-rod consist of two parallel bars, having teeth in the side, which front each other. Let a toothed wheel be placed between them, having only the half of its circumference furnished with teeth. It is evident, without any further description, that if this wheel be turned uniformly round its axis, the piston-rod will be moved uniformly up and down without intermission. This has often been put in practice, and the piston-rod made to work between grooved rollers, but the machine always went by jolts, and seldom lasted a few days. Unskilful mechanics attributed this to defects in the execution, but the fault is essential, and lies in the principle. The machine could not perform a single stroke without breaking, if the first mover did not slacken a little, or the different parts of the machine did not yield by bending, or by compression, and no strength of materials could withstand the violence of the strains at every reciprocation of the motion. This is chiefly experienced in great works, which are put in motion by a water-wheel, or some other equal power, exerted on the mass of matter of which the machine consists. The water-wheel, being of great weight, moves with considerable steadiness, or uniformity; and when an additional resistance is opposed to it by the beginning of a new stroke of the piston, its great quantity of motion is but little affected by this addition, and it proceeds with very little loss of motion. The machine must either yield a little by bending, and compression, or go to pieces, which is the common event. Cranks are free from this inconvenience, because they accelerate the piston gradually, and bring it gradually to rest, while the water-wheel moves round with almost perfect uniformity. The only inconvenience attending this slow motion of a piston at the beginning of its stroke, is, that the valves do not shut with rapidity, so that some water gets back through them. But when they are properly formed and loaded, this is but trifling.

PARALLEL Planes are those planes which have all the perpendiculars drawn betwixt them equal to each other. And it is demonstrated, that two right lines perpendicular to the same plane are parallel to each other; and that if one of two parallel right lines be perpendicular to any plane, the other will also be perpendicular to the same plane; that planes, to which one and the same right line is perpendicular, are parallel to each other; that all right lines, perpendicular to one of two parallel planes, are perpendicular to the other; that right lines parallel to one and the same right line, though not in the same plane with it, are also parallel to each other; that if two right lines, meeting each other, be respectively parallel to two other right lines, also meeting each other, and not being in the same plane with them, the angles contained by those lines will be equal; that if two right lines, meeting each other, be respectively parallel to two other right lines, also meeting each other, and not being in the same plane with them, the planes extended by those lines will be parallels; and that the sections, made by a plane cutting two parallel planes, are also parallel the one to the

other: and hence parallel lines, terminated by the same parallel planes, are equal to each other.

PARALLEL Rays, in *Optics*, are those which keep at an equal distance in respect to each other, from the visible object to the eye, which is supposed to be infinitely remote from the object.

PARALLEL Ruler, called also *Parallelism*, an instrument consisting of two wooden, brass, or steel rulers, A B and C D, (*Plate X. Geom. fig. 11.*) equally broad every where, and so joined together by the cross blades E F and G H, as to open to different intervals, and accede and recede, yet still retain their parallelism. The use of this instrument is obvious; for one of the rulers being applied to R S, and the other withdrawn to a given point V; a right line A B, drawn by its edge through V, is a parallel to R S; and thus, having given only one line, and erected a perpendicular upon it, we may draw any number of parallel lines, or perpendiculars to them; by only observing to set off the exact distance of every line with the point of the compasses.

But the best parallel rulers are those whose bars cross each other, and turn on a joint at their intersection; one end of each bar moving on a centre, and the other ends sliding in grooves as the rulers recede. See *fig. 12.*

PARALLELS, or *Places of Arms*, in a siege, are deep trenches fifteen or eighteen feet wide, joining the several attacks together; and serving to place the guard of the trenches in, to be at hand to support the workmen when attacked. There are generally three in an attack; the first is about three hundred toises from the covert-way, the second one hundred and sixty, and the third near or on the glacis. They are said to have been first invented or used by M. Vauban.

Thus, in *Plate VII. Fortification, fig. 2*, let A, B be the bastions to be attacked, whose capitals, as well as that of the ravelin C, being indefinitely produced towards the field, set off three hundred fathoms from the salient angles, *r, s*, of the covert-way to the points *l, m*; and from the centre, *o*, of the place, describe an arc of a circle through the points *l, m*, whose intersections with the capitals will terminate the several parts of the first parallel E, which is terminated at twenty fathoms beyond the faces produced of the two adjacent ravelins *z, X*, next to the front attacked. Take *ln, m q*, each equal to one hundred and forty fathoms, and describe from the centre, *o*, another part of a circle through the points *n, q*; and its intersection with these capitals will terminate the several parts of the second parallel F, which extends only ten fathoms beyond the faces of the ravelins *z, X*. Lastly, draw lines through the salient angles of the glacis, and they will give the third parallel G. When this is done, take the points *d, e*, in the capitals of the bastions, at about eight hundred fathoms from the salient angles, *r, s*, of the covert-way, and join them by a right line, which will express the beginnings of the attacks. From the point *f*, in *de*, at about twenty-four or twenty-six fathoms from the point *e*, draw a line *fg* or H of any length, as one hundred and twenty or one hundred and twenty-six fathoms, for the first approach, but so as, when produced, to fall ten or twelve fathoms from the farthest salient angle of the covert-way: from the point *g* draw *gh*, so as to fall as much from the farthest salient angle on the other side of the place; and the point *h* is taken, so as to be nearly at the same distance from the capital *se* as the point *g*; and from the point *h* draw the line *hi*, so as to fall again as far from the farthest salient angle in the first side, and that the point *i* be equally as distant from the capital *se* as the point *h*; and thus continue the approaches to the third parallel. The approaches are traced after the same manner as the capital *d e*, and also

on the capital of the ravelin C, from the second parallel to the third; always observing that no part of them is to be seen or enfiladed from any part of the fortification, nor to defile too much, which would occasion unnecessary labour. As the approaches advance nearer the place, they become shorter, as they make smaller angles with each other. Between the second and third parallels, at the returns of the approaches, are made places of arms, such as I, about thirty or forty fathoms long, nearly parallel to the third parallel, which serve to receive the troops that are to cover the workmen, till the third parallel is quite finished. When the principal or outlines of the trenches are thus traced, parallels are drawn to them on the side towards the field, at twelve feet distance in the approaches, fifteen in the first and second parallels, and at eighteen in the third; and the intervals between these and the former lines will express the width of the trenches. At the ends of the second parallel are made square redoubts, as K, K, of about ten or twelve fathoms on each side, to protect it more effectually from the sallies of the besieged. The first part, *de*, of the trenches is an epaulement of about ten feet high to cover the horse designed to guard the trenches. Muller's *Attack and Def. of Fortified Places*, p. 21, &c.

PARALLELS, or *Parallel Circles*, in *Geography*, called also *parallels of latitude*, and *circles of latitude*, are lesser circles of the sphere, conceived to be drawn from west to east, through all the points of the meridian; commencing from the equator, to which they are parallel, and terminating with the poles.

They are called *parallels of latitude*, &c. because all places lying under the same parallel have the same latitude.

PARALLELS of *Latitude*, in *Astronomy*, are lesser circles of the sphere parallel to the ecliptic, imagined to pass through every degree and minute of the colures.

They are represented on the globe by the divisions of the quadrant of altitude, in its motion round the globe, when screwed over the poles of the ecliptic.

PARALLELS of *Altitude*, or *Almucantars*, are circles parallel to the horizon, imagined to pass through every degree and minute of the meridian between the horizon and zenith; having their poles in the zenith.

On the globe these are represented by the divisions on the quadrant of altitude, in its motion about the body of the globe, when screwed to the zenith.

PARALLELS of *Declination*, are the same with parallels of latitude in geography.

PARALLELS, *Anti*. See ANTI-PARALLELS.

PARALLEL *Sphere*, that situation of the sphere in which the equator coincides with the horizon, and the poles with the zenith and nadir.

In this sphere, all the parallels of the equator become parallels of the horizon; consequently no stars ever rise or set, but all turn round in circles parallel to the horizon; and the sun, when in the equinoctial, wheels round the horizon the whole day.

After his rising to the elevated pole, he never sets for six months; and after his entering again on the other side of the line, he never rises for six months longer.

This position of the sphere is their's who live under the poles, if any such there be; their sun being never above $23^{\circ} 30'$ high.

PARALLEL *Sailing*, in *Navigation*, is the sailing under a parallel of latitude.

Of this there are but three cases. 1. Given the departure, and distance; required the latitude. The canon for

which is, as the difference of longitude is to the radius, so is the distance to the cosine of latitude.

2. Given the difference of longitude between two places under the same parallel; required their distance. The canon is, as radius to difference of longitude, so is cosine of latitudes to distance.

3. Given the distance between two places in the same latitude; required their difference of longitude. The canon is, as the cosine of latitude to distance, so is radius to difference of longitude. See SAILING.

PARALLEL *Cut*, in *Inland Navigation*, is a counter-drain to carry off water, and prevent the adjoining lands from being flooded.

PARALLELA, a word used by medical writers to express a sort of scurf or leprous appearance, affecting only the palms of the hands. It is a symptom of the pox.

PARALLELEPIPED, in *Geometry*, one of the regular bodies, or solids, comprehended under six parallelograms, the opposite ones of which are similar, parallel, and equal; as in *Plate X. Geometry*, fig. 13.

A parallelepiped is by some defined an upright prism, whose base is a parallelogram, and the planes of whose sides are perpendicular to the plane of the base. A rectangular parallelepiped is that whose bounding planes are all right angles, and which stand at right angles one to another; and every rectangular parallelepiped is said to be contained under the planes that are its length, breadth, and altitude.

It is demonstrated, that if from one of the angular points of any parallelogram, a right line be elevated above the plane of the parallelogram, so as to make any angles with the contiguous sides of it, and there be also drawn, from the three remaining angular points, three other right lines parallel and equal to the former, and the extremes of these lines be joined, the figure thus described will be a parallelepiped. If the angle of the parallelogram be right, and the elevated line be erected perpendicular to the plane of the base, then will the parallelepiped be a rectangular one.

PARALLELEPIPED, *Properties of the*. All parallelepipeds, prisms, and cylinders, &c. whose bases and heights are equal, are themselves equal.

Every upright prism is equal to a rectangular parallelepiped of equal base and altitude.

A diagonal plane divides the parallelepiped into two equal prisms: a rectangular prism, therefore, is half a parallelepiped upon the same base, and of the same altitude.

All parallelepipeds, prisms, cylinders, &c. are in a ratio compounded of their bases and altitudes: wherefore, if their bases be equal, they are in proportion to their altitudes; and conversely.

All parallelepipeds, cylinders, cones, &c. are in a triplicate ratio of the homologous sides; and also of their altitudes.

Equal parallelepipeds, prisms, cones, cylinders, &c. are in the reciprocal ratio of their bases and altitudes.

Rectangular parallelepipeds, contained under the corresponding lines of three ranks of proportionals, are themselves proportionals.

To measure the Surface and Solidity of a Parallelepiped.—Find the areas of the parallelograms I L M K, L M O N, and O M K P (see PARALLELOGRAM); add these into one sum, and multiply that sum by 2: the product will be the surface of the parallelepiped.

If, then, the base I L M K be multiplied by the altitude M O, the product will be the solidity.

Suppose, *v. gr.* L M = 56, M K = 15, M O = 12. Then
 $L I K M = 36 \times 15 = 540$; $L M O N = 36 \times 12 = 432$;
 M m M O K P

$MOKP = 15 \times 12 = 180$. The sum of which is $= 1152$, which multiplied by 2, gives the superficies equal to 2304. And 540×12 gives the solidity equal to 6480. Or the solid content of a parallelepiped may be obtained by multiplying the area of the base by the altitude of the parallelepiped. *E. g.* If the two dimensions of the base be 16 and 12 inches, and the height of the solid 10 inches; then the area of the base being 192, the content of the solid will be 1920 cubical inches.

The parallelepiped with oblique angles is a figure very common to many kinds of stones, especially of the softer sort. The common crystallizations of grottos break naturally into fragments of this shape; and the stalactites which hang down from their roofs in form of icicles, are originally small hollow pipes formed by the water which continually trickles down drop by drop; and whose outer surfaces, fixing themselves by their small bases, form by degrees a sort of blunted pyramids, which like so many rays from the axis, which is the hollow pipe, grow hollow at last. This axis seems to be composed of plates, almost cylindrical, laid one over another; but, if broken, the whole divides into fragments of a parallelepiped figure: the blunted pyramids that are about the axis divide themselves at first into other blunted pyramids; but afterwards almost all these fragments divide of themselves into other fragments of a parallelepiped figure, this seeming every where the ultimate shape of the particles.

In the mountain of Berege there is found a vast quantity of asbestos; the stone upon which this grows, though in itself of no determinate figure externally, always breaks into regular parallelepipeds: nor is this peculiar to these stones found naturally concentered on the surface or within the bowels of the earth, but it is also found in such as are concentered by means of art out of the water in which they are originally suspended.

The water of the fountain de Salut, near Bagneres in Gascony, when evaporated to a certain degree, yields a scum on the surface, which also adheres to the sides of the vessel; and this scum, examined by the microscope, is found to be composed of many regular parallelepipeds. If the same waters, and those of several other springs, be evaporated to a dryness, there remains a white shining powder, out of which the microscope can direct us to several the like regular figures. *Phil. Trans. N^o 472. p. 32.*

PARALLELISM, the quality of a parallel, or that which denominates it such: or it is that whereby two things, *v. gr.* lines, rays, or the like, become equidistant from one another.

Thus, we say, remote objects are scarcely perceptible, by reason of the parallelism of their rays.

PARALLELISM of the Earth's Axis, in *Astronomy*, or motion of parallelism, is that invariable situation of the earth's axis, in its progress through its orbit, whereby it still looks nearly to the same point of the heavens, *viz.* towards the pole-star; so that if a line be drawn parallel to its axis, while in any one position; the axis, in all other positions or parts of the orbit, will always be nearly parallel to the same line. This parallelism is the necessary result of the earth's double motion; the one round the sun, the other round its own axis. Nor is there any necessity to imagine a third motion, as some have done, to account for this parallelism.

It is to this parallelism that we owe the vicissitudes of seasons, and the inequality of day and night.

PARALLELISM of Rows of Trees. The eye placed at the end of an alley bounded by two rows of trees, planted in parallel lines, never sees them parallel, but always inclining to each other, towards the farther extreme.

Hence mathematicians have taken occasion to enquire, in what lines the trees must be disposed, to correct this effect of the perspective, and make the rows still appear parallel? To this purpose parallel they must not be, but diverging; but according to what law must they diverge? The two rows, in fine, must be such, as that the unequal intervals of any two opposite or corresponding trees may be seen under equal visual angles.

On this principle, F. Fabry has asserted, without any demonstration; and F. Tacquet, after him, has demonstrated by a long and intricate synthesis; that the two rows of trees must be two opposite semi-hyperbolas.

M. Varignon has since, in the Memoirs of the Royal Academy, ann. 1717, found the same solution by an easy and simple analysis. But he renders the problem much more general, and requires not only that the visual angles be equal, but to have them increase, or decrease, in any given ratio: provided the greatest do not exceed a right angle. The eye he requires to be placed in any point either just at the beginning of the ranges, or beyond, or on this side.

All this laid down, he supposes the first row to be a right line, and seeks what line the other must be, which he calls the *curve of the range*. This he finds must be an hyperbola, to have the visual angles equal. The straight and hyperbolic rows will be seen parallel to infinity; and if the opposite semi-hyperbola be added, we shall have three rows of trees (the straight one in the middle), and all three parallel.

Nor is it required this second hyperbola be the opposite of the first, *i. e.* of the same kind, or have the same transverse axis: it is enough, if it have the same centre, its vertex in the same right line, and the same conjugate axis. Thus the two hyperbolas may be of all the different kinds possible; yet all have the same effect.

Again, the straight row being laid down as before; if it be required to have the trees appear under decreasing angles, M. Varignon shews, that if the decrease be a certain ratio, which he determines; the other line must be a parallel straight line.

But he goes yet farther, and supposing the first row any curve whatever, he seeks for another that shall make the rows have any effect desired, *i. e.* be seen under any angles equal, increasing, or decreasing.

Notwithstanding the ingenuity of this speculation, it has been satisfactorily demonstrated by M. D'Alembert, and M. Bouguer, that in order to produce the effect proposed, the trees are to be ranged merely in two diverging right lines. *Encyclopedie.*

PARALLELISM, in *Hebrew Poetry*, is a term used by bishop Lowth for expressing the correspondence of one verse, or line, with another. When a proposition is delivered, and a second is subjoined to it, or drawn under it, equivalent, or contrasted with it in sense, or similar to it in the form of grammatical construction; these the learned prelate calls *parallel* lines; and the words, or phrases, answering one to another in the corresponding lines, are denominated *parallel* terms. Parallel lines, he says, may be reduced to three sorts; parallels synonymous, parallels antithetic, and parallels synthetic. Of these the author has given a variety of examples, exhibiting their various forms, from the books universally acknowledged to be poetical; the correspondent examples from the prophet Isaiah; and sometimes also from the other prophets; in order to shew, that the form and character of the composition are in all the same. It is observed, that the several sorts of parallels are perpetually

mixed with one another; and that this mixture gives a variety and beauty to the composition.

Parallel lines synonymous are those which correspond one to another by expressing the same sense in different, but equivalent terms; when a proposition is delivered, and is immediately repeated, in the whole or in part, the expression being varied, but the sense entirely or nearly the same. Examples occur in the following passages: *viz.* Pf. xxi. 1, 2. Prov. i. 24—32. Isaiah, lv. 6, 7. If. liv. 4. If. li. 7, 8. Joel, xi. 7. Pf. cxii. 1. If. xlvi. 3. Prov. iii. 9. If. lv. 3. In the foregoing examples there are different degrees of synonymous parallelism. The parallel lines sometimes consist of three or more synonymous terms; sometimes of two, which is generally the case, when the verb, or the nominative case of the first sentence, is to be carried on to the second, or understood there; sometimes of one only, as in the four last examples. Among the foregoing there are a few instances, in which the lines consist of double numbers, or two propositions. The author has subjoined one or two more of these, very perfect in their kind, occurring in Pf. cxliv. 5, 6. If. lxxv. 21, 22.

Parallels are also sometimes formed by a repetition of part of the first sentence; as in Pf. lxxvii. 1. 11. 16. If. xxvi. 5, 6. Hosea, vi. 4.

Sometimes in the latter line a part is to be supplied from the former to complete the sentence; as in 2 Sam. xxii. 41. Job, xxvi. 5. If. xli. 28.

There are also parallel triplets; when three lines correspond together, and form a kind of stanza, of which, however, only two commonly are synonymous: Pf. cxii. 10. Job, iii. 4. 6. 9. If. ix. 20. Joel, iii. 13. There are likewise parallels consisting of four lines; two distichs being so connected together, by the sense and the construction, as to make one stanza. Such is the form of the xxxviii. Psalm. See particularly Pf. xxxvii. 1, 2. If. i. 3. If. xlix. 4. Amos, i. 2.

Some periods may be considered as making stanzas of five lines, in which the odd line, or number, either comes in between two distichs, or after two distichs making a full close: as in Job, viii. 5, 6. If. xlvi. 7. Hof. xiv. 9. Joel, iii. 16. If. xlv. 26. In stanzas of four lines sometimes the parallel lines answer to one another alternately; the first to the third, and the second to the fourth; as in Pf. ciii. 11, 12. If. xxx. 16. If. l. 16.

The second parallels are the antithetic; when two lines correspond with one another by an opposition of terms and sentiments; when the second is contrasted with the first, sometimes in expressions, sometimes in sense only. Accordingly the degrees of antithesis are various, examples of which occur in Prov. x. 1. Prov. x. 7. Prov. xi. 24. Prov. xxix. 26. Prov. xvi. 33. See also Pf. xx. 7, 8. Pf. xxx. 5. Pf. xxxvii. 10, 11. If. liv. 10. If. ix. 10.

The third sort of parallels comprehends those, which are called synthetic, or constructive; where the parallelism consists only in the similar form of construction; in which word does not answer to word, and sentence to sentence, as equivalent or opposite; but there is a correspondence and equality between different propositions, in respect of the shape and turn of the whole sentence, and of the constructive parts; such as noun answering to noun, verb to verb, number to number, negative to negative, interrogative to interrogative. See Pf. cxlviii. 7—13. Job, xii. 13—16. If. lviii. 5—8. The following passages are constructively parallel, *viz.* Pf. cxxxv. 6, 7. If. l. 5, 6. Micah, vi. 15. See also Prov. xxx. Prov. vi. 16—19. Eccl. xi. 2. If. li. 19. Cantic. i. 5. If. xv. 3.

Of the three different sorts of parallels, above-enumerated, every one has its peculiar character and proper effect;

and therefore they are differently employed on different occasions; and that sort of parallelism is chiefly made use of, which is best adapted to the nature of the subject and of the poem. Synonymous parallels have the appearance of art and concinnity, and a studied elegance; they prevail chiefly in shorter poems; in many of the psalms; in Balaam's prophecies; frequently in those of Isaiah, which are most of them distinct poems of no great length. The antithetic parallelism gives an acuteness and force to adages and moral sentences; and therefore abounds in Solomon's proverbs, and elsewhere is not often to be met with. The poem of Job, being on a large plan, and in a high tragic style, though very exact in the division of the lines, and in the parallelism, and affording many fine examples of the synonymous kind, yet consists chiefly of the constructive. A happy mixture of the several sorts gives an agreeable variety; and they serve mutually to recommend and set off one another. Lowth's Preliminary Dissertation to his "New Translation of Isaiah."

PARALLELOGRAM, in *Geometry*, a quadrilateral right-lined figure, whose opposite sides are parallel, and equal to each other.

A parallelogram is generated by the equable motion of a right line always parallel to itself.

When the parallelogram has all its four angles right, and only its opposite sides equal, it is called a *rectangle*, or an *oblong*.

When the angles are all right, and the sides are all equal, it is called a *square*, which some make a species of parallelogram, others not.

If all the sides are equal, and the angles unequal, it is called a *rhombus*, or *lozenge*.

If both the sides and angles be unequal, it is called a *rhomboides*.

Every other quadrilateral whose opposite sides are neither parallel nor equal, is called a *trapezium*. See each of these, under their respective names.

PARALLELOGRAM, *Properties of the*. In every parallelogram, what kind soever it be of, *e. gr.* A B C D, *Plate X. Geometry, fig. 14.* a diagonal D A divides it into two equal parts; the angles diagonally opposite B, C, and A, D, are equal; the opposite angles of the same side, C, D, and A, B, &c. are, together, equal to two right angles; and each two sides together are greater than the diagonal. Every quadrilateral whose opposite sides are equal, is a parallelogram.

Two parallelograms A B C D, and E C D F, on the same, or on an equal base C D, and of the same height A C, or between the same parallels A F, C D, are equal. And hence two triangles C D A, and C D F, on the same base, and of the same height, are also equal; and all parallelograms or triangles whatever, whose bases and altitudes are equal among themselves.

Hence, also, every triangle C F D is half a parallelogram A C D B upon the same, or an equal base C D, and of the same altitude, or between the same parallels. Hence also a triangle is equal to a parallelogram, having the same base, and half the altitude, or half the base, and the same altitude.

Parallelograms, therefore, are in a given ratio, compounded of their bases and altitudes. If then the altitudes be equal, they are as the bases; and conversely.

In similar parallelograms and triangles, the altitudes are proportional to the homologous sides; and the bases are cut proportionably thereby. Hence, similar parallelograms and triangles are in a duplicate ratio of their homologous sides, also of their altitudes, and the segments of their bases: they

are, therefore, as the squares of the sides, altitudes, and homologous segments of the bases.

In every parallelogram, the sum of the squares of the two diagonals is equal to the sum of the squares of the four sides; and the two diagonals bisect each other. For the triangles AEB , DEC , (*fig. 15.*) being equi-angular, on account of the equal vertical and alternate angles, and having one side $AB =$ one side DC , will have $AE = CE$, and $BE = DE$. Moreover, because the double of the square of a line drawn from the vertex to the middle of the base of any triangle, together with double of the square of the semi-base, is equal to the squares of both the sides taken together, $2AE^2 + 2ED^2 = AD^2 + CD^2$, and by doubling these, we shall have, because four times the square on half a line is equal to the square on the whole line (see SQUARE), $4AE^2 + 4ED^2 = AD^2 + CD^2 + 4AE^2 + 4ED^2 = AD^2 + BC^2 + CD^2 + AB^2$.

This proposition, M. de Lagny takes to be one of the most important in all geometry; he even ranks it with the celebrated forty-seventh of Euclid, and with that of the similitude of triangles; and adds, that the whole first book of Euclid is only a particular case of it. For if the parallelogram be rectangular, it follows, that the two diagonals are equal; and, of consequence, the square of a diagonal, or, which comes to the same thing, the square of the hypotenuse of a right angle, is equal to the squares of the sides.

If the parallelogram be not rectangular, and of consequence, the two diagonals be not equal, which is the most general case, the proposition becomes of vast extent; it may serve, for instance, in the whole theory of compound motions, &c.

There are three ways of demonstrating this proposition; the first by trigonometry, which requires twenty-one operations; the second geometrical and analytical, which requires fifteen. M. de Lagny gives a more concise one, in the Mémoires de l'Acad. which only requires seven.

To find the area of the right-angled parallelogram $ABCD$, (*fig. 14.*) Find the length of the sides AB and AC ; multiply AB into AC , the product will be the area of the parallelogram. Suppose, *e. gr.* AB to be 345; AC 123; the area will be 42435.

Hence, 1. Rectangles are in a ratio compounded of their sides AB and AC . 2. If, therefore, there be three lines continually proportional; the square of the middle one is equal to the rectangle of the two extremes: and if there be four proportional lines, the rectangle under the two extremes is equal to that under the two middle terms.

Other parallelograms, not rectangular, have their areas found by resolving them, by diagonals, into two triangles, and adding the areas of the separate triangles into one sum; or by multiplying their bases into their altitudes.

PARALLELOGRAM, *Complement of a* See COMPLEMENT.

PARALLELOGRAM, *Centre of Gravity of a*. See CENTER of Gravity, and CENTROBARYC Method.

PARALLELOGRAM, *Newtonian or Analytic*, in Algebra, an appellation used for an invention of sir Isaac Newton, to find the first term of an infinite converging series.

This is sometimes called the method of the parallelogram and ruler; because a ruler or right line is also used in it.

This analytic parallelogram is formed by dividing any parallelogram into equal squares or parallelograms, by lines drawn horizontally and perpendicularly through the equal divisions of the sides of the parallelogram. The cells, thus formed, are filled with the dimensions of the quantities x and y , and their products.

The powers, $y^0 = 1$, y , y^2 , y^3 , y^4 , &c. of y , for instance

being placed in the lowest horizontal range of cells, and the powers of x , or $x^0 = 1$, x , x^1 , x^2 , &c. in the vertical column to the left, or *vice versa*; so that these powers and their products will stand as in *Plate XVII. Analysis, fig. 4.*

Thus, when any literal equation is proposed, mark such of the parallelograms or cells as correspond to all its terms; and let a ruler be applied to two, or perhaps more of the parallelograms so marked, of which let one be the lowest in the left-hand column at AB , the other touching the ruler towards the right hand; and let all the rest not touching the ruler lie above it. Then select those terms of the equation which are represented by the parallelograms that touch the ruler, and from them find the quantity to be put in the quotient.

This is sir Isaac Newton's famous rule, of the application of which he has left us some examples in his Method of Fluxions and Infinite Series, p. 9 and 10, but without demonstration; which has been since supplied by others. See Mr. Colson's Comment on that treatise, p. 192, seq. MacLaurin's Algebra, p. 251, seq. and particularly Mons. Cramer's *Analyf. des Lignes Courbes*, chap. vii. p. 148, seq.

This learned author observes, that this invention, which is the true foundation of the method of series, was but imperfectly understood, and not valued as it deserved for a long time. He thinks it more convenient in practice to use the analytic triangle of the abbé de Gua, which takes in no more than the diagonal cells lying between A and C , and those which lie between them and B .

PARALLELOGRAM, or *Parallelism*, also denotes a machine used for the ready and exact reduction or copying of designs, schemes, prints, &c. in any proportion; which is done hereby without any knowledge or habit of *designing*; which see.

The parallelogram is also called pentagraph. See its description and use under PENTAGRAPH.

PARALLELOGRAM of the Hyperbola, in Geometry, is used for the parallelogram formed by the two asymptotes of an hyperbola, and the parallels to them, drawn from any point of the curve. A parallelogram thus formed is of an invariable magnitude in the same hyperbola; and the rectangle of its sides is equal to the power of the hyperbola. L'Hôpital, *Señ. Coniq. Art. 99—101.* See POWER.

This parallelogram is the modulus of the logarithmic system; and if we take it as unity, the hyperbolic sectors and segments will correspond to Napier's, or the natural logarithms. If the parallelogram be taken $= 0.43429$, &c. these sectors and segments will represent Briggs's logarithms. See LOGARITHM.

Huygens has made use of this term, *De Caus. Gravitat. in fin.* See LOGARITHMIC Curve.

PARALLELOGRAM *Protractor*, a mathematical instrument, consisting of a semicircle of brass, with four rulers in form of a parallelogram, made to move to any angle: one of these rulers is an index, which shews on the semicircle the quantity of any inward or outward angle.

PARALLELOPIPEDIA, in *Natural History*, the name of a genus of spars, thus called, because regularly of a parallelepiped or paralepiped form.

They are pellucid crystalline spars, externally of a determinate and regular figure, always found loose, detached, and separate from all other bodies, and in form an oblique paralepiped, with six parallelogram sides and eight solid angles, easily fissile, either in an horizontal or perpendicular direction, being composed of numbers of thin plates, and those of very elegantly and regularly arranged bodies, each of the same form with the whole mass, except that they are thinner in proportion to their horizontal planes; and naturally

rally fall into these and no other figures, on being broken with a slight blow.

Of this genus Hill has enumerated four known species. 1. The hard, pellucid, and colourless one, called the island crystal of authors. (See *Island CRYSTAL*.) 2. A dull and whitish kind, found in France, Germany, and England, particularly in the Derbyshire and Yorkshire lead-mines, and about Scarborough. This has the same property with the former, of giving a double refraction; but it is so dull and opaque, that it does not shew it so elegantly. 3. A soft, whitish, and very bright one, found principally in the lead-mines of Yorkshire, and about the sea-shores of that county. And, 4. A dull, hard, and pale brown one: this is found in the lead-mines of the same county, and in some parts of Ireland. All these species have the same power of double refraction with the first, but are too opaque to shew it so beautifully, and often have not transparency enough to make it at all distinguishable.

PARALLELOPLEURON, a term used by some writers for an imperfect parallelogram, or a kind of trapezium, having unequal angles and sides, but which observe a certain regularity and proportion.

PARALOGISM, *παραλογισμὸς*, in *Logic*, a false reasoning, or a fault committed in demonstration, when a consequence is drawn from principles that are false, or, though true, are not proved; or when a proposition is passed over, which should have been proved by the way.

A paralogism differs from a sophism in this, that the sophism is committed out of design and subtlety; and paralogism out of mistake, and for want of sufficient light and application.

Yet Messieurs du Port Royal do not seem to make any difference between them.

PARALOPHIA, a word used by Keil, and some other anatomical writers, to express the lower and lateral part of the neck.

PARALOURGES, *παραλουργῆς*, among the ancients, a kind of garment, with a purple clavus on each side. See **CLAVUS**.

PARALYSIS, in *Botany*. See **PRIMROSE**.

PARALYSIS, in *Medicine*. See **PALSY**.

PARALYTIC, a person afflicted with the paralysis, or palsy.

PARAMARIBO, or **PARAMAIRAMBA**, in *Geography*, a considerable town of South America, and capital of Surinam, or Dutch Guiana, occupying a pleasant gravelly situation, on the banks of the river Surinam, which is here about a mile in breadth. The number of houses, chiefly constructed of timber, is about 1400. and that of the inhabitants is about 5000; the town contains two churches, and two Jewish synagogues: the streets are all perfectly straight, and lined with trees, such as oranges, lemons, shaddocks, and tamarinds. It is about 18 miles from the sea, and has a good harbour. N. lat. 5° 48'. W. long. 55° 11'.

PARAMBAH, a town of Hindoostan, in Bahar; 17 miles E. of Bahar.

PARAMECIUM, in *Vermeology*, a genus of worms of the order Infusoria, of which the generic character is this; an invisible, simple, pellucid, flattened worm. There are seven species mentioned by Gmelin, which are as follow:

Species.

* **AURELIA**. This is compressed, longitudinally plaited towards the fore part, behind it is acute. This, says Mr. Adams, is rather a large animalculum, four times longer than it is broad; the fore part is obtuse, transparent, and apparently without intestines; the hind part is filled with

molecules of various sizes; the fold that goes from the middle to the apex is a striking characteristic of the species, forming a kind of triangular aperture, and giving it somewhat the appearance of a gimblet. Its motion is rectilinear, reeling, or staggering, and generally vehement. This species is frequently found in ditch-water, and in infusions, cohering lengthwise; the lateral edges of both bodies appear bright. They may sometimes be seen lying on one another alternately, at others adhering by the middle. They will live many months in the same water, without its being renewed. They are to be found in the month of June, in ditches where there is plenty of duck-weed.

* **CHIRYSALIS**. This is cylindrical, longitudinally plaited on the fore part, and obtuse behind. It is an inhabitant of salt water, is very like the last, but is more obtuse behind. The margins are filled with black globules.

* **OVIIFERUM**. Depressed, with large oval molecules within: the body is oval, pellucid, with black grains towards one end.

MARGINATUM. This is depressed, is grey, and has a double margin. It is, says Mr. Adams, one of the largest of the genus, flat, elliptical, and every part filled with molecules, except in the lower end, where there is a pellucid vesicle. This animalculum is surrounded by a broad double margin, and at the moment of its expiring, a bright spiral intestine is observable.

CAUDATUM. This species is pointed at both ends, the middle is the broader, and filled with molecules. It is found in waters among duck-weed; its motion is very slow.

ANCEPS. The tail of this species is two-edged, and the head is obtuse. The motion of this animalculum is very slow; it is found in the water, in which the plant hydrocharis is produced.

ACUTUM. Tail two-edged, head acute; inhabits stagnant water; is slow in its motions, continually agitating its tail.

VERSUTUM. This species, mentioned by Adams, is cylindrical, the lower part thick, and both ends very obtuse. It has an oblong green gelatinous body, filled with molecules; the lower part is thick, the fore part is smaller, both ends are obtuse, and they may be seen to propagate by division. It is found in ditches.

PARAMESE, *παραμῆσον*, in the *Ancient Music*, the ninth chord or sound in the diagramma, or scale of music.

The word is Greek, and signifies *juxta medium*, next to the middle; its situation in the first state of the scale, being next the mese, or middle chord.

It was the note above the mese, which answers to *a-la-mi-re* of Guido's scale. Hence, as the paramese was the first of the diazeugmenon tetrachord, it will be equivalent to Guido's highest \sharp mi. See **DIAGRAM**.

PARAMESOS, a word used by some to express the ring-finger, that next the little one.

PARAMESWARA, in *Mythology*, a name given to the Hindoo deity Siva by his sectaries. Hindoos of some sects give this name exclusively to Brahm, the supreme ruler; others apply it to the deity whom they more particularly worship. In one of the Puranas, Lakshmi is invoked under the name of Paramaiswarya-rupini, meaning with the countenance of Parameswara; but in strictness it seems more applicable to the supreme ruler, as noticed under the article **MAYA**.

PARAMETER, in *Geometry*, a constant right line in each of the three conic sections; called also *latus rectum*. In the parabola the rectangle of the parameter, and an abscissa, is equal to the square of the correspondent semi-ordinate. See **PARABOLA**.

In an ellipsis and hyperbola, the parameter is a third proportional to a conjugate, and transverse axis. See ELLIPSIS and HYPERBOLA.

PARAMO, LUIZ DE, in *Biography*, a native of Borox, in the diocese of Toledo, archdeacon and canon of Leon, and afterwards inquisitor in Sicily, is author of a most extraordinary work, entitled "De Origine et Progressu Officii Sanctæ Inquisitionis, ejusque Dignitate et Utilitate," which was undertaken under the patronage of D. Gaspar de Quiroga, then archbishop of Toledo, and inquisitor-general, and which was pronounced by Nicholas Antonio, to be a work full of various learning. It was printed in folio at Madrid in 1598, and afterwards at Antwerp, in 1614, and a copy of the first edition is in Dr. Williams' library in Redcross-street, London. Mr. Southey, in the *General Biography*, has given an analysis of this book, from whose account we shall give a short extract, to shew the inquisitor's mode of reasoning.

Paramo begins by proving God to have been the first inquisitor, who convicts Adam and Eve of heresy, infidelity, apostasy, and blasphemy. God cited Adam, otherwise the process would have been null. On Adam's appearance, he made inquisition into the crime. The man accused his wife, and then the judge questioned her: he did not examine the serpent, because of his obstinacy. The examinations were secret and separate, that there might be no collusive lying. He calls no witnesses, and affirms that confession and confession are as a thousand witnesses, and save the judge all the trouble, except that of condemning. The whole, he says, was done secretly, that it might be a precedent for the holy office; and so closely does this holy office observe the precedent, that they make the dress of penitent offenders after the very pattern of the clothes which God made for Adam and Eve, and confiscate all the property of a heretic, because Adam and Eve were turned out of paradise. The author then goes on to shew that Abraham was an inquisitor, so were David and Solomon, Christ, and a multitude of others, but our readers will easily believe, after the specimen we have given, he can prove any thing. It had been well had Paramo stopped here, but he was one of the most savage practical inquisitors that ever existed. In proof of this it is sufficient to observe, that, he himself says, in the course of one hundred and fifty years, the inquisition had burnt thirty-thousand witches, and he claims great part of the merit for himself, saying he had punished very many of them. We cannot help saying, that unless the British government insist upon the abolition, not only of the existing inquisition in Spain, but also of the laws (which we know on good authority still remain) which sanction so savage a court, they cannot with any degree of propriety be said to be contending for the liberties of mankind. We hope the noble marquis, the hero of the times, will immortalize his name by destroying every vestige of it.

PARAMORES, in *Geography*, a small island in the Atlantic, near the coast of Virginia. N. lat. $37^{\circ} 36'$. W. long. $75^{\circ} 44'$.

PARAMOUNT, in our *Law*, signifies the supreme lord of the fee.

There may be a tenant to a lord, who holdeth himself of another lord; in respect whereof the former lord is called *lord mesne* (see MESNE), and the latter *lord paramount*.

All honours, which have manors under them, have the lord paramount.

But even the term lord paramount is only comparative; for as one man may be great, compared to a less; and little, being compared with a greater; so none truly seems to be

lord paramount but the king, who is patron paramount to all the benefices in England. See MANOR and TENANT.

PARAMOUSIR, or POROMASHIR, in *Geography*, the second of the Kurile or Kurilskoi islands; between which and Shoombshu, the Irait is but two versts broad. It extends from N.E. to S.W., and is twice as large as Shoombshu, and, according to Capt. Cook, is the largest of the Kuriles under the dominion of Russia. The land is very high, and when visited by Capt. Cook's navigators, in his Third Voyage, Oct. 13, 1779, it was entirely covered with snow. It is richly furnished with roots and minerals, but destitute of wood. Here is no scarcity of red foxes, wolves, and all kind of mice. Mr. King places the S. end of this island in N. lat. $49^{\circ} 58'$, and the N. end in lat. $50^{\circ} 46'$. E. long. $156^{\circ} 14'$.

PARAMUTTY, a town of Hindoostan, in the Carnatic, taken by the British in 1790; 10 miles S.W. of Coveriporum.

PARANA, the longest and most considerable stream of the Rio de la Plata, which rises in the grand mineral mountains of Brasil, S. lat. 19° , and bending S., then W. till it receives the Iba Parana, after which it bends S.W. till it is joined by the Paraguay; while the conjunct rivers are still called the Parana by the natives, and the Rio de la Plata by the Spaniards. Yet the length of the Paraguay, according to the map of La Cruz, does not yield above half a degree to that of the Parana; and the straightness of its course gives it the appearance of the principal river. The grand cataract of the Parana is in lat. 24° , not far from the ruined town of Cuayra; but is rather a series of rapids, for a space of 12 leagues, amidst rocks of tremendous and singular forms. Dobrizhoffer asserts that the Parana is the chief stream, which receives the Paraguay and Uruguay. The inundations are chiefly in December and January, rising about five or six yards above the islets. This noble river is studded with numerous islands; and Spanish vessels navigate to the town of Assumption, about 400 leagues from the sea. On the shores are often found geods, inclosing crystals; but the natural history of the Parana is almost as obscure as that of the true Maranon. The breadth of the estuary is such, that the land cannot be discovered from a ship in the middle of the stream. Pinkerton.

PARANA, a town on the W. coast of the island of Samar. N. lat. $11^{\circ} 54'$. W. long. $124^{\circ} 48'$.—Also, a town of Brasil, on the coast of the island of Marajo. S. lat. $0^{\circ} 12'$. W. long. $51^{\circ} 36'$.

PARANAGUA, a river of Brazil, which runs into the Atlantic, S. lat. $25^{\circ} 30'$.

PARANA-MERIN, a river of Brazil, which runs into the Atlantic, S. lat. $2^{\circ} 50'$. W. long. $42^{\circ} 46'$.

PARANAPANEMA, a river of Paraguay, which runs into the Parana.

PARANETE, in the *Ancient Music*, was a name sometimes used to signify the next note or chord to the nete, or last note of a tetrachord.

Hence it might be called the penultimate chord. It was otherwise, and more properly called the *lichanos*, or index.

PARANETE *Diezeugmenon*, in the *Greek Music*, was the penultimate note of the diezeugmenon tetrachord, and answers to Guido's *de-la-fol-re*. See DIAGRAM.

PARANETE, *Hyperbolæon*, was the penultimate note of the hyperbolæon tetrachord, and answers to Guido's *g-fol-re-ut*. See DIAGRAM.

PARANOMASIA, is a figure that occurs when two words, very near in sound, but different in sense, respect each

each other in the same sentence; this is usually called a pun.

PARANOO, in *Geography*, a river of Malacca, which runs into the sea, N. lat. 4° 40'. E. long. 103° 25'.

PARANYMPH, PARANYMPHUS, among the ancients, the person who waited on the bride-groom, and directed the nuptial solemnities; called also *pronubus* and *auspex*, because the ceremony begun with taking auspicious.

In strictness, the paranymph, *παρὰνυμφος*, only officiated on the part of the bride-groom; on the part of the bride a woman officiated, who was called *pronuba*.

The Jews had likewise a kind of paranymphs, which the Talmud and rabbins call *ששׁבׁים*, *schuschelim*, q. d. *companions of the spouse*.

The fourth council of Carthage appoints, that when the married couple come to ask the priest's blessing, they be presented either by their fathers and mothers, or by their paranymphs.

PARAPET, BREASTWORK, in *Fortification*, a defence, or screen, on the extreme of a rampart, or other work, serving to cover the soldiers and the cannon from the enemy's fire. See *Plate VII. Fortification, fig. 3.*

Borel gives us, from Jos. Maria Surenhus, a curious collection of names, which the ancients and moderns have given to this kind of parapet: the Latins call them *subarra*, and *bastia*, whence the names bastion and bastille. They also call them *paginematata*, *lorica*, and *antemuralia*. The Spaniards call them *barbacanes*; the Italians, *parapetti*, because of their defending the breast, *petto*; whence our parapet.

Parapets are raised on all works, where it is necessary to cover the men from the enemy's fire; both within and without the place, and even in the approaches. See *Mr. Vauban's Method of Fortification*, under the article *Military CONSTRUCTION*.

The thickness of the parapet should be about eighteen or twenty feet, in order to be cannon-proof, and it should be about seven or eight feet high, when the enemy has no command above the battery; otherwise it should be raised high enough to cover the men while they load the guns. Its length depends on the number of guns to be employed in the battery: for one gun, it is common to allow eight yards in length, and six yards more for every other gun. The parapet consists of two parts, the wall contained in one piece from end to end, and about two and a half or three feet high, and the merlons, which are detached pieces of the parapet, leaving openings, called embrasures, through which the cannon deliver their shot.

The parapet of the wall is sometimes of stone. The parapet of the trenches is either made of the earth dug up; or of gabions, fascines, barrels, sacks of earth, or the like.

PARAPET is also a little wall, breast-high, raised on the brinks of bridges, quays, or high buildings; to serve as a stay, and prevent people's falling over.

PARAPH, a particular character, knot, or flourish, which people habituate themselves to make always in the same manner at the end of their name, to prevent their signature from being counterfeited.

The paraph of the kings of France used to be a grate, which the secretaries always place before their own, in all letters, &c. Menage derives the word from *paragrapheus*. See PARAGRAPH.

PARAPHERNALIA, or PARAPHERNA, in the *Civil Law*, those goods which a wife brought her husband, besides her dower, and which were still to remain at her disposal, exclusive of her husband, unless there was some provision made to the contrary in the marriage-contract.

The word is formed from the Greek *παρα*, *beyond*, or *over*, and *φερν*, *dos*, *dower*. "In his rebus quas extra dotem mulier habet, & quas Greci *παρὰφερνα* vocant, nullam, uxore prohibente, vir habeat communionem." Cod. de Pactis.

The Grand Customary of Normandy gives a different sense to the word; it calls paraphernalia the moveables, linen, and other female necessaries, which are adjudged to a wife, in prejudice to the creditors, when she renounces the succession of her husband.

Some of our English lawyers give a still different sense to the word paraphernalia, defining it to be such goods as a wife challengeth over and above her dower, or jointure after her husband's death; as furniture for her chamber, wearing apparel, and jewels, which are not to be put in the inventory of her husband's goods.

Accordingly the apparel and ornaments of a wife, suitable to her rank and degree, are paraphernalia; and even the jewels of a peeress, usually worn by her, have been held to be paraphernalia. (Moor, 213.) These she becomes entitled to at the death of her husband, over and above her jointure or dower, and preferably to all other representatives. (Cro. Car. 347. 1 Roll. Abr. 911. 2 Leon. 166.) Neither can the husband devise by his will such ornaments and jewels of his wife; though during his life perhaps he hath the power (if unkindly inclined to exert it) to sell them or give them away. (Noy's Max. c. 49. *Grahme v. lord Londonderry*, 24 Nov. 1746. *Caſt*.) But if she continues in the use of them till his death, she shall afterwards retain them against his executors and administrators, and all other persons except creditors, where there is a deficiency of assets. (1 P. Wins. 730.) And her necessary apparel is protected even against the claim of creditors. Noy's Max. c. 49.

PARAPHIMOSIS, or PARAPHYMOSIS, from *παρα*, *back*, and *σιμων*, *to bridle*. This term, in *Surgery*, is applied to the case, in which the prepuce is drawn backward, behind the glans penis, and cannot be brought forward again. The complaint is the very reverse of phymosis, which is attended with a contraction of the opening of the prepuce, so that the glans cannot be uncovered. Both these diseases are mostly the consequence of an inflammatory thickening of the prepuce, arising from the irritation of gonorrhœa, a chancre, or simple excoriations. Paraphymosis very frequently follows phymosis, by the thickened prepuce being very improperly drawn back behind the glans. In this circumstance, the constricted part of the prepuce acts as a ligature round the body of the penis, and retards the return of blood from the glans, and the portion of the prepuce beyond the stricture. Hence, œdematous inflammation attacks the latter part, while the former becomes prodigiously distended, and, it is evident, that mortification of the glans and part of the prepuce may be produced by the complaint.

Paraphymosis frequently admits of being expeditiously relieved, by compressing as much of the blood as possible out of the glans penis, and then pushing this part back again through the stricture. In order to perform this operation skilfully, the surgeon should first make continued pressure on the glans, by placing it between the ends of the thumb, index, and middle fingers of each hand. The whole surface of the part should thus be gradually compressed at the same time for the space of four or five minutes. Then the two thumbs are to be employed, both in pushing backward the diminished glans, and, together with the fingers, in drawing forward the prepuce. The cases, which cannot thus be relieved, are extremely few. When the plan fails, however, leeches should be applied to the glans, and the flow of blood be afterwards promoted by immersing the part in warm water.

In almost every case, the preceding method will now be found completely effectual. But, if it should not do so, as much blood must be taken away by venesection, as the state of the patient will well bear, and the part is either to be covered with a cold saturnine poultice, or the lotio plumbi superacetatis. When, notwithstanding every exertion, and the strict observance of antiphlogistic means, the œdematous swelling increases instead of subsiding, the only way to prevent a mortification of the glans and prepuce is to make an incision, just behind the former part, through that portion of the prepuce which forms the constriction. A small scalpel is the best instrument, and care must be taken to cut to a sufficient depth. In most surgical books, paraphymosis is represented as a venereal complaint, and demanding the exhibition of mercury; but the history, which we have here given of it, must convey a different, and, we trust, a more accurate notion of the complaint. When paraphymosis originates from the irritation of a chancre, mercury is indeed necessary for the cure of the sore; but the paraphymosis does not itself absolutely require this medicine, and may be at once cured by compressing the glans and pushing it back through the constricted part of the prepuce. Paraphymosis from gonorrhœa never stands in need of mercury. See First Lines of Practice of Surgery, by S. Cooper, edit. 3.

PARAPHONIA, from *παρὰ*, and *φωνή*, *the voice*, signifies a depraved sound of the voice in speaking, and of course is not applicable to dumbness. Dr. Cullen makes six species of *morbid voice*, viz. 1. Paraphonia *puberum*, or the harsh and rough voice of males about the period of puberty. 2. *P. rauca*, or hoarseness, connected with dryness or swelling in the fauces. 3. *P. resonans*, or nasal tone, from obstructed nostrils. 4. *P. palatina*, or the change of voice arising from a less or division of the uvula, or pendulous palate. 5. *P. clangens*, when the voice acquires a shrill, acute, and small sound. And, 6. *P. comatosa*; when, from relaxation of the palate and glottis, a stertorous sound is made during inspiration. Cullen, Nosol. Meth. Gen. 112.

PARAPHONIA, in *Musical*, is that species of concord which results from different sounds, as the fifth and fourth: and thus it differs from *homophonia*, which is produced by the same sounds, as in the unison, and from *antiphonia*, or the replication of the same sounds, as in the octave.

PARAPHORA, a word used by the ancients to express a slight kind of delirium, or light-headedness in a fever: some have made it to signify a delirium in general.

PARAPHRASE, *παρὰφρασις*, an explanation of some text in clearer and more ample terms, whereby we supply what the author might have said or thought on the subject. See TEXT.

Colomesius looks on Erasmus's Paraphrase on the New Testament as so extraordinary a work, that he makes no scruple to declare, he thinks the author to have been divinely inspired when he penned it.

PARAPHRASE, *Chaldee*, is a phrase frequent among the critics and divines, denoting an ancient version of the bible, in Chaldee. There are three Chaldee paraphrases on the Pentateuch: that of Onkelos, whom some take to be the same with Aquila, and whom others take to have been that Onkelos whom the Talmudists, in the treatise "Gittin," make a nephew of the emperor Titus. The second is the paraphrase of Jonathan. The third is called the Targum of Jerusalem. See TARGUM.

The Chaldee paraphrase on the prophets is that of Jonathan son of Uziel, whom some confound with Theodotus.

The author of the Chaldee paraphrase on the Hagiographers is unknown. Some attribute it to one Joseph, fur-

named the Squinter; others to rabbi Akiba. Others say there is so much difference in the style, that no one person can have been the author of the whole.

The paraphrase of Onkelos is that which is most esteemed by the modern Jews, and read in their synagogues. See Walton Pref. Polyglott.

PARAPHRENTIS, *παρὰφρενίτις*, in *Medicine*, sometimes written *paraphrensis*, is not derived, it would appear, from *φρην*, *mens*, and therefore synonymous with *phrenitis*, or *phrensy*, but from *φρενες*, *præcordia*; and it is synonymous with *diaphragmitis*, which signifies an inflammation of the diaphragm. The disease, indeed, is described as accompanied by severe delirium, but its seat is in the diaphragm, and consequently the pain and most distressing symptoms are referred to the præcordia.

Authors who have described the paraphrenitis, have mentioned the symptoms attendant upon pleurisy, together with constant delirium and a *risus sardonicus*, or convulsive laughter, as characterizing the disease. They describe the respiration as exceedingly short and quick, being performed entirely by the motion of the ribs, the tender state of the diaphragm not admitting of its motion, and therefore preventing the expansion of the cavity of the chest in that direction. They mention also other symptoms, indicative of the inflammatory soreness of the diaphragm, especially an extreme increase of the pain of the chest upon coughing, sneezing, reaching, vomiting, straining at stool, &c. See Boerhaave, Aphorism 909.

But there appears to have been some mistake, in referring such a fever, with delirium, and convulsive laughter, to an inflammation of the diaphragm: and every practitioner will now accord with the observation of Dr. Cullen, when he observes, (First Lines, par. cccxlii.) "an inflammation of the pleura covering the upper surface of the diaphragm has been distinguished by the appellation of *paraphrenitis*, as supposed to be attended with the peculiar symptoms of delirium, risus sardonicus, and other convulsive motions; but it is certain, that an inflammation of that portion of the pleura, affecting also even the muscular substance of the diaphragm, has often taken place without any of these symptoms; and I have not met with either dissections, or any account of dissections, which support the opinion, that an inflammation of the pleura covering the diaphragm is attended with delirium more commonly than other pneumonic inflammation." The result of modern investigation of disease, by dissection after death, is in fact demonstrative of the error of referring such a fever to inflammation of the diaphragm; and when it does occur, it must be obviously ascribed to a morbid affection of the sensorium itself. See FEVER and PLEURISY.

PARAPHROSYNE, or *Alienation of Mind*, signifies, in the writings of some physicians, a slight and transitory derangement of the intellect, or non-febrile delirium, especially the temporary delirium occasioned by intoxicating and narcotic substances, such as spirituous liquors, opium, stramonium, hyoscyanus, hemp or bang, nightshade, hemlock, the betel leaf, &c. &c. Sauvages Nosol. Meth. class. viii. gen. 17.

PARAPITE, in *Geography*. See MADEIRA.

PARAPLEGIA, and PARAPLEXIA, from *παρὰ*, and *πλησσω*, *I strike*, signify, in the writings of the older authors, a palsy affecting the whole body below the neck. Dr. Cullen and the moderns confine it to a palsy, affecting half the body *transversely*, in contradistinction from the hemiplegia, which affects one side, or half the body *longitudinally*. See PALSY.

PARAPOTAMIA, in the *Materia Medica of the Ancients*, a word used at first as an epithet of distinction for a kind

kind of œnanthe, from which the œnanthine ointment of the Greeks was made; but afterwards used simply as the name of that plant. This kind of œnanthe was the most fragrant of all the kinds, and was therefore used for making the ointment preferably to the rest.

Theophrastus makes a very great difference in the œnanthe of different places, observing that the Cyprian kind was fragrant, and fit for making this sweet ointment; but that the Grecian had no smell at all: and thence it probably arose, that the Greeks used afterwards the flowers of the wild vine for this purpose, and called them by the same name.

Pliny's account of this ointment is by no means to be depended upon. The whole passage where he names it, and the others of the like kind, is taken from the account of Apollodorus, in Athenæus; but it is so carelessly translated by Pliny, that the author's sense can scarcely any where be made out.

PARAPROSDOCIA, παραπροσδοκία, in *Rhetoric*, the same with paradox. See PARADOX.

PARARYTHMOS, an epithet used by the ancients to express any kind of pulse, which did not seem suitable to the age and state of the person.

PARASANG, παρασαγγήνη, or FARSANG, an ancient Persian measure different at different times, and in different places; being usually thirty, sometimes forty, and sometimes sixty stadia or furlongs.

The word, according to Littleton, has its rise from *parafch, angarius, q. d.* the space a postman rides from one station, *angaria*, to another.

Cassaubon cites a fragment of the architect Julian, who says, that the most common measure of the parasang, in his time, was forty stadia; and reckoning each stadium at one hundred and twenty-five geometrical paces, they would hereby avoid fractions in the computation of distances; forty stadia, of one hundred and twenty-five paces each, making five thousand Roman paces. The authors of the Universal Dictionary, vol. ii. p. 19, fol. ascribe the introduction of this measure to Keykobod, one of the Persian kings of the second race, who employed his soldiers in making great roads through the empire, setting up public marks at the end, as they say, of every four thousand paces, which space was called by the Persians, *pherfength*, and from thence by the Greeks, *parasang*.

PARASÄOLI, in *Geography*, a town of Hindooftan, in the circle of Jyenagur; 15 miles N.N.E. of Jyepour. N. lat. 27° 10'. E. long. 76° 48'.

PARASCENIUM, among the Romans, was a place behind the theatre, whither the actors withdrew to dress, undress, &c. more frequently called *postscenium*.

PARASCEVE, παρασκευη, the sixth day of the last week of Lent, popularly called *Good Friday*.

St. John says, our Saviour was crucified on the parasceve of the Passover, *i. e.* on the eve or day of preparation of the Passover: for Isidore and Papias observe, that the word in the original Greek signifies preparation, and was applied among the Jews to Friday, because on that day they used to prepare what was necessary for the celebration of the sabbath. Exod. xv. 23. xxxv. 2, 3.

Hence, what our translation of the New Testament renders preparation of the sabbath, M. Simou, and some others, call *parascova*.

PARASCHE, from פֶּרַשׁ, *to divide*, a name which the Jews give to that portion of the Pentateuch which they read every sabbath. They divide their five books of the law, not into chapters, as we do, but into fifty-four parts, which they call *parasche*: and thus go through the whole in a

VOL. XXVI.

year. To these they have added some verses of the prophets, which they made use of under the persecution of Antiochus Epiphanes, when they were prohibited the use of the law.

PARASCHIDES, a word used by chirurgical writers to express the splinters of fractured bones, or the fragments of bones corroded by sharp humours.

PARASEISMA, a sort of exercise prescribed by the Greek physicians in many cases. It was a general concussion of the body.

PARASELENE, formed from παρα, *near*, and σεληνη, *moon*, in *Physiology*, a mock moon: a meteor, or phenomenon encircling or adjacent to the moon, in form of a luminous ring; in which are sometimes observed one, sometimes two apparent images of the moon.

The paraselenes are formed after the same manner as the parhelia, or mock-suns, by reflections of the moon from zones of dense vapours that happen to be collected in the sky.

Pliny mentions three moons, which were seen in the year of Rome 632. Eutropius also informs us, that he saw three moons at Rimini, in the year 234 before Christ. Hevelius also saw three moons at Dantzic, in 1660. And similar phenomena have been observed at different times, by many others. These paraselenes have been seen, accompanied with tails and coloured circles, like those which accompany the parhelia. An account of several, and a particular description of a fine appearance of this kind, may be found in Muschenbroeck's Introduction, p. 1046. See HALO and PARIELIUM.

PARASEMUM, παρασημον, among the ancients, a sign painted or carved on the prow of ships, by which they were distinguished from one another. The sign was commonly the figure or picture of some animal, as the bull, lion, &c. or of any other thing, as a mountain, tree, flower, &c.

PARASIOPEISIS, παρασιωπησις, in *Rhetoric*. See PARALEPSIS.

PARASITE, παρασιτης, among the Greeks, was originally a very reputable title: the parasites being a kind of priests, or at least ministers of the gods; in the same manner, as at Rome were the epulones.

They took care of the sacred corn; or the corn destined for the service of the temples, and the gods; *viz.* sacrifices, feasts, &c. They had even the intendance over sacrifices, and took care that they were duly performed. At Athens there was a kind of college of twelve parasites; each people of Attica furnishing one, who was always chosen out of one of the best families.

Polybius adds, that parasite was also an honourable name among the ancient Gauls, and was given to their poets; but of late it has been made a term of reproach, and used for a flatterer and mean dependant.

PARASITE Plants, in *Gardening*, are all those which are produced upon the trunks, branches, or any other parts of other plants or roots: and which, in some instances, will not take their growth in the ground, as in the cases of mistletoe, various mosses, and the fungus tribe in general, but not always.

The particular manner in which these sorts of plants attach themselves to those of other kinds is not by any means constant or uniform. Some, such as the mistletoe, mosses, and fungi, are produced originally upon the plants on which they are found growing; the first of which grows upon the branches of large trees, principally from the under sides of them multiplying and extending its roots underneath the bark; and its top branches or spreads out into a large head, which, for the most part, grows downwards in a hanging position,

position, being nourished wholly at the expence of the tree or plant upon which it grows: the mosses, on the contrary, are in general dispersed all over the surfaces of the stems and branches; and the fungi sometimes fix themselves upon the upper roots of old trees, and at others upon their trunks or stems.

There are other plants of this nature which arise from the ground, and the stems of which fix on and attach themselves to the first plants which they meet with, or that come in their way, into which they strike root, in consequence of which the first or ground roots die, or are decayed, the plants continuing to live and nourish themselves upon the plants into which they have struck, and on which they are fixed.

And there are still other kinds of this sort of plants, which first root in the ground, their stems attaching themselves to the bodies of trees or other substances within their reach, striking their roots into their barks, or other matters, as they rise or grow upon them; but still continuing their ground roots, and drawing their chief nourishment from the earth. This is the case in the ivy kind of plants, and some others of a similar nature and habit of growth.

Several of these plants are highly injurious and mischievous to garden, fruit, and other trees, as the mistletoe and moss, to those of the apple kind; and the ivy, as well as sometimes the funguses, both to fruit and forest trees. They should therefore be constantly removed from them by the gardener as soon as they are perceived to have fixed or established themselves on them.

This, in the first or mistletoe kind, should be done by cutting away the top parts, and then completely destroying the roots, while the plants are in an early state of growth. And, in the moss forts, by means of rubbing and scraping them off from the trunks and branches in a complete manner by a stiff brush, or some other way, afterwards washing them well with soft soap and water, then keeping the trees sufficiently thinned out in their different parts.

The fungi about the roots of trees may be easily removed and destroyed by any sort of slight digging of the ground near them.

PARASITEUM, among the ancients, a granary or place where the sacred corn, designed for religious purposes, was preserved. See PARASITE.

PARASO, in *Geography*, a town of France, in the department of Golo (or isle of Corsica,) and chief place of a canton, in the district of Calvi. The canton contains 2471 inhabitants.

PARASOL, a little moveable, in manner of a canopy, borne in the hand to screen the head from the sun, rain, &c. more usually called *umbrella*.

It is made of leather, taffety, oil-cloth, &c. mounted on a stick, and opened or shut at pleasure, by means of pieces of whalebone that sustain it. The East Indians never stir without a parasol.

The word is French; and that used against rains is sometimes called *parapluie*.

PARASOPIAS, in *Ancient Geography*, a country of Greece, in Thessaly, between Asopus and Sparchius, and above Heraclea. Strabo.

PARASPHAGIS, a word used by some anatomical writers to express that part of the neck which is contiguous to the clavicles.

PARASTATA, in *Ancient Architecture*, a kind of pier, or piedroit, serving as a defence or support to a column or arch.

Mr. Evelyn makes the parastata the same with pilaster.

Barbaro, and others, the same with anta; and Daviler, the same with piedroit. See PILASTER.

PARASTATÆ, EPIDYDIMIDÆ, in *Anatomy*. See GENERATION.

PARASTREMMA, a name given by medical writers to a convulsive distortion of the mouth, or of any part of the face.

PARASU RAMA, in *Hindoo Mythology*, is one of the ten grand incarnations of their deity Vishnu. On this occasion he was born the son of a pious Brahman named Jamadagni, and his wife Runeka. (See these articles.) This incarnation or avatara is said to have taken place in Agra, for the purpose of relieving mankind from a military government, which had become insupportably oppressive. Parasu Rama fought twenty battles with one of the oppressive rajas, slew him, and extirpated the race. After a life spent in mighty and holy deeds, Rama gave his whole property in alms, and retired to the Kokan, or Concan, the low country between Surat and the Southern Cape, though not the whole extent of this tract, (see CONCAN,) where the Hindoos say he is still living. In pictures, this Rama (for there are three of this name whose exploits form the subject of the Ramayana, to which article, and to Rama, the reader is referred,) is usually represented two-armed, holding a battle axe and a lotus, combating his twenty-armed foe Raja Diruj. The epithet *parasu*, distinguishingly prefixed to the name of this hero, means a *sword*, and denotes his warlike character. Some authorities say that Rama was educated by Siva, and going one day to pay his respects on Kailasa, he was prevented from entering by Ganefa, whom he knew not. Enraged at his insolence, he wrenched a scimeter from his hand, and cut off his head, and was hence surnamed *Parasu*, the *cutter-off*. Ganefa is a name of Pollear. See the latter article.

PARATECA, in *Geography*, a town of Brazil, in the Francisco; 240 miles W. of St. Salvador.

PARATELLA, a town of Hindooostan, in the circar of Condapilly; 5 miles N. of Condapilly.

PARATHENAR, in *Anatomy*, a name given by Winslow to two muscles of the foot. His parathenar major is that part of the abductor minimi digiti, which arises from the os calcis: the parathenar minor is the flexor brevis minimi digiti.

PARATHESIS, in the *Greek Church*, the prayer which the bishop rehearses over the catechumens, stretching his hands over them to give them benediction; and which they receive, bowing their heads under his hands.

PARATHESIS (popularly called *brackets* or *crotchets*) is also the name of a kind of point or mark, as [], used in writing, chiefly to include synonyma, explicatives, and the like matters, not essential to the discourse. See PARENTHESIS.

PARATHESIS, in *Grammar*, *opposition*; or a figure whereby two or more substantives are put in the same case.

PARATHREMA, from *παρα*, and *αρθρον*, a *joint*, in *Surgery*, a luxation, or dislocation. Also, a tumour caused by a protrusion of parts; a rupture, or hernia.

PARATI, in *Ichthyology*, the name of a Brasilian fish of the mullet kind, much resembling that species called *curema*, or *taintra*, in all respects but size, and in the colour of its eyes, the iris of which, instead of the silvery colour it has in the curema, is of a fine yellow. Its flesh also, when dressed, is drier than that of the curema, which see.

PARATIANÆ, in *Ancient Geography*, a town of Africa, in Mauritania Cæsariensis, on the route from Lemna to Hippona, between Ruficades and Calucitena, according to the Itin. of Antonine.

PARATILMUS, in the *Ancient Greek Jurisprudence*, a name

a name given to a sort of punishment imposed on adulterers, who were poor, and unable to stand the common penalty.

It consisted either in making them run a horse-radish up the anus, which they called *απορίσσανδρασις*; or in tearing up by the roots the hair about the pudenda, which they called *παράτιλος*, of *παρτίλλειν*, to *tear, pluck up*.

PARATINGA, in *Geography*. See XINGU.

PARATITLES, PARATITLA, in *Jurisprudence*, short notes, or summaries of the titles of the Digest and Code; which have been made by several lawyers, in order to compare and examine the connexion of the several parts with one another.

We have paratitles of Cujas, of Maran, &c. Chaffaucus has a second comment on the paratitles of Cujas.

PARATOLA, in *Geography*, a town of Bengal; 8 miles S.S.E. of Islamabad.

PARATOUNKA, an ostrog of Kamtschatka, on a river which runs into the Avatcha; 10 miles W. of St. Peter and St. Paul.

PARAVAIL, PARAVAILLE, in *Law*, the lowest tenant of a fee; or he that is immediate tenant to the land.

He is called *tenant paravail*, because, it is presumed, he hath profit and avail by the land. See TENANT.

PARAVANGAH, in *Geography*, two small islands near the coast of Bengal. N. lat. 22° 50'. E. long. 89° 35'.

PARAVANI, a town of Turkish Armenia; 50 miles S.S.E. of Akalziké.

PARAUTE, a town of South America, in the province of Venezuela, on lake Maracaybo; 80 miles S. of Venezuela.

PARAWA, a town of India, on the route from Agra to Oujein; 14½ miles N.W. from Soofneer. The soil in its vicinity is black and spongy, like most of Malava or Malwa, but little cultivated. The district dependent on this town yields one lack of rupees annually. Asiatic Ref. vol. vi. p. 62.

PARAY-le-Monias, a town of France, in the department of the Saone and Loire, and chief place of a canton, in the district of Charolles, near the river Bourbinec; 6 miles W. of Charolles. The place contains 2848, and the canton 7258 inhabitants, on a territory of 235 kilometres, in 12 communes. N. lat. 46° 27'. E. long. 4° 12'.

PARAZONIUM, *παράζωνιον*, or *Scipio*, among *Medicists*, a sceptre rounded at the two ends in manner of a truncheon, or commander's staff; or a kind of poignard, or short sword, represented as worn at the girdle, on several ancient medals.

Antiquaries are much divided on the explication of the parazonium; as, indeed, the form and manner of bearing it are very different. It is sometimes thrown across the shoulders in manner of a quiver.

PARBOILING, in *Pharmacy*, &c. a term applied to fruits, herbs, &c. which are boiled a little while, to draw out the first juices, in order to be afterwards inspissated or thickened. See BOILING.

PARBOSENA, in *Ancient Geography*, a town of Asia, in the environs of Cappadocia, upon the route from Tavia to Sebaste, between Sibora and Carniana, according to the Itinerary of Antonine.

PARBUCKLE, in *Seamanship*, a contrivance used by sailors as a substitute for a crane or tackle. It is formed by fastening the *bight* of a rope to the place from whence the weight, such as a cask or bale, is to be raised or lowered; the two parts of the rope are then passed under the quarters of the cask, and bringing them back again over it, the ends of the rope are hauled upon to raise the weight, or gradually

slackened together, and the cask or bale suffered to roll easily downwards to whatsoever may receive it below.

PARCÆ, so called, says Servius, on the fourth eclogue of Virgil, by antiphrasis, because they spare nobody, *quod nemini parcant*, goddesses who, according to the ancient Pagan theology, preside over the periods or durations of human lives. These the ancients frequently confounded with the Fates, or Destinies; and, in effect, the Parcæ, according to Plato, were the daughters of Necessity and Destiny. According to Hesiod, they were the daughters of Jupiter and Themis, by whom he had also the Seasons; but in another place he says, they were the offspring of Night and Erebus.

The Parcæ were three, Clotho, Lachesis, and Atropos; because, forsooth, all things have their beginning, progress, and end. Hence the poets tell us, the Parcæ spun the thread of men's lives; that Clotho held the distaff, and drew the thread; Lachesis twirled the spindle, and spun it; and Atropos cut it:

“Clotho eolum retinet, Lachesis net, & Atropos occat.”

The ancients represent the Parcæ divers ways: Lucian, in the shape of three poor old women, having large locks of wool, mixed with daffodils, on their heads; one of which holds a distaff, the other a wheel, and the third a pair of scissars, with which to cut off the thread of life. Others represent them otherwise; Clotho appearing in a long robe of divers colours, wearing a crown upon her head, adorned with seven stars, and holding the distaff in her hand; Lachesis in a robe beset with stars, with several spindles in her hand; and Atropos, clad in black, cutting the thread with large scissars.

The ancients imagined, that the Parcæ used white wool for a long and happy life; and black for a short and unfortunate one.

Pausanias says, that these goddesses had some temples in Greece, and statues in several places. He informs us, that in the city of Olympia, there was an altar consecrated to Jupiter, the inventor of the Parcæ, near which these goddesses had another; and from the same author we learn, that among the other figures upon Cypselus's chest, was to be seen that of a kind of monster, with a wild and savage air, great tusks, and crooked hands, which was known to be a Parca from an inscription upon it.

PARCAS, in *Geography*, a town of Walachia; 16 miles S. of Brancovani.

PARCAY, a town of France, in the department of the Mayne and Loire; 12 miles S.E. of Baugé.

PARCE', a town of France, in the department of the Sarthe; 6 miles E. of Sablé.

PARCEL-MAKERS, two officers in the exchequer, who make parcels of the excheator's accounts, wherein they charge them with every thing that they have levied for the king's use, within the time of their office, and deliver the same to one of the auditors of the court to make their accounts therewith.

PARCELS, *Bill of*. See BILL.

PARCELLING, RIGGING, in *Ship Building*, long narrow slips of canvas payed or dipt in soft tar, which are bound round the surface of ropes in spiral turns, as smoothly as possible, before it is *served*, that the rope may not be uneven, or full of ridges, and to further preserve it from the injuries of weather, &c.

PARCELLING a *Scam*, is laying a slip of canvas, prepared as above, over the seam, first paying under it, and then over it, with soft tar or melted pitch. This should be always per-

formed when seams are covered by the cheeks of the leads, &c. or, what is better, covered with sheet copper.

PARCELOR, in *Geography*, a mountain of Asia, on the coast of Salengore, near the straits of Malacca. N. lat. 2° 45'. E. long. 101° 29'.

PARCENERS, quasi *Parcellers*. See CO-PARCENERS.

Parceners are so called, says Littleton (§ 309.), because they may be constrained to make *partition*, of which there are several kinds. (See PARTITION.) The properties of parceners are, in some respects, like those of *joint-tenants* (see that article); as they have the same unities of interest, title, and possession. They may sue and be sued jointly for matters relating to their own lands (Co. Litt. 164); and the entry of one of them shall, in some cases, enure as the entry of them all. (Ibid. 188, 243.) They cannot have an action of trespass against each other; but herein they differ from joint-tenants, that they are also excluded from maintaining an action of waste (2 Inst. 403); for co-parceners could at all times put a stop to any waste by writ of partition, but till the statute of Henry VIII. joint-tenants had no such power. Parceners also differ materially from joint-tenants in other points. 1. They always claim by descent, whereas joint-tenants always claim by purchase. 2. There is no unity of time necessary to an estate in co-parcenary. 3. Parceners, though they have an unity, have not entirety, of interest.

PARCHIM, in *Geography*, a town of the duchy of Mecklenburg, on the Elda, which divides it into New and Old Town, in each of which is a church. The number of inhabitants is about 3000; 34 miles S. of Wismar. N. lat. 53° 28'. E. long. 11° 55'.

PARCHMENT, in *Commerce*, &c. sheep or goats' skin prepared after a peculiar manner, which renders it proper for several uses; particularly for writing on, and for the covering of books, &c.

The word comes from the Latin *Pergamena*, the ancient name of this manufacture; which it is said to have taken from the city of Pergamos, to Eumenes, king whereof, its invention is usually ascribed; though, in reality, that prince appears rather to have been the improver than the inventor of parchment; for the Persians of old, according to Diodorus, wrote all their records on skins; and the ancient Ionians, as we are told by Herodotus, made use of sheep-skins and goat-skins in writing, many ages before Eumenes's time. Nor need we doubt, that such skins were prepared and dressed for that purpose, after a manner not unlike that of our parchment, though, probably, not so artificially. Vide Diod. Sicul. lib. ii. p. 84. Herodot. lib. v. Prid. Connect. part i. lib. vii. p. 708.

Dr. Prideaux is a strenuous advocate for the antiquity of parchment; and he imagines that the authentic copy of the law which Hilkiah found in the Temple, and sent to king Josiah, was formed of this material; because no other used for writing, parchment excepted, could be of so durable a nature as to last from the time of Moses till that period, for eight hundred and thirty years. But it has been replied to this argument, that the Egyptians wrote on linen those things which they designed for long duration; and those who have examined mummies with attention, assure us, that the characters so written continue to this day. It is not, therefore, improbable, that a copy of the law of Moses, written after this manner, might have lasted eight hundred and thirty years. Besides, it is not very likely that those skins which were used, according to the testimony of Diodorus and Herodotus, by the Persians and Romans for writing, long before the time of Eumenes, were dressed like parchment. They must have been prepared in a much

runder manner, and have little resembled the parchment, of which Eumenes is said to be the inventor; because, if it had been found out before, it would have rendered the want of the Egyptian papyrus no inconvenience to that prince. Such skins might do for records, and for some occasional writings, but would have been by no means proper for books. Hence some writers have concluded, that parchment was a later invention than the Egyptian paper.

Parchment constitutes a very considerable article in the French commerce; it is made in most of their cities; and, besides the consumption at home, they send vast quantities abroad, particularly to England, Flanders, Holland, Spain, and Portugal.

That called *virgin* parchment is somewhat thinner and finer than the rest; and is most proper for certain purposes, as fans, &c. and made of the skin of an abortive lamb, or kid.

PARCHMENT, *Manufacture of*. The skin having been stripped of its wool, and having passed the lime-pit (after the manner described under the article SHAMMY), the skinner stretches it on a kind of frame, consisting of four pieces of wood, mortised into each other at the four angles, and perforated lengthways from distance to distance, with holes furnished with wooden pins, that may be turned at pleasure, like those of a violin.

To stretch the skin on this frame, they make little holes all around it, and through every two holes draw a little skewer; to this skewer they tie a small piece of pack-thread, and tie that over the pins; so that coming to turn the pins equally the skin is strained tight every way, like that of a drum.

The skin being thus sufficiently stretched on the frame, the flesh is pared off with a sharp instrument for that purpose; this done, it is moistened with a rag; and a kind of white stone, or chalk, reduced to a fine dust, is strewed over it: then, with a large pumice-stone, flat at bottom, much after the manner of a mullet for grinding colours, they rub over the skin as if about to grind the chalk; and thus they scour off the remains of the flesh. Then they go over it again with the iron instrument; again moisten it as before, and again rub it with the pumice-stone without any chalk underneath; this smoothens and softens the flesh-side very considerably. They then drain it again, by passing over it the iron instrument as before.

The flesh-side being thus drained, they pass the iron on the wool or hair-side; then stretch it tight on the frame, by means of the pins, and go over the flesh-side again with the iron; this finishes its draining; and the more the skin is drained, the whiter it always becomes.

They now throw on more chalk, sweeping it over with a piece of lamb-skin that has the wool on; this smoothens it still farther, and gives it a white down or knap. It is now left to dry, and when dried it is taken off the frame, by cutting it all round.

The skin, thus far prepared by the skinner, is taken out of his hands by the parchment-maker, who first scrapes or pares it dry on the summer with an iron instrument like that above-mentioned, only finer and sharper; with this, worked with the arm from top to bottom of the skin, he takes away about one-half of its thickness. The skin, thus equally pared on both sides, they pass the pumice-stone over both sides, to smoothen it. This last preparation is performed on a kind of form or bench covered with a sack stuffed with straws, and it leaves the parchment in a condition for writing on.

The paring of the skin dry on the summer is the most difficult preparation in the whole process of parchment-making; for which reason, the skimmers seldom dare meddle with

with it, but usually leave it to those more experienced in it; the summer, whereon it is performed, is a calf-skin well-stretched on a frame, serving as a support to the skin, which is fastened a-top of it with a wooden instrument, that has a notch cut in it. Lastly, that the iron knife may pass the easier between the summer and the skin to be pared, they put another skin, which they call the counter-summer. The parings, thus taken off the skin, are used in making glue, size, &c.

What we call *vellum*, is only parchment made of the skins of abortive calves, or, at least, of sucking calves; it is finer, whiter, and smoother, than the common parchment; but it is prepared in the same manner as that, except that it is not passed through the lime-pit.

PARCHMENT, To make a green transparent. Wash the parchment in cold ley, till it come clear from it; then squeeze out the liquor as much as possible; and if you would have it of a fine green colour, take distilled verdigris, ground with vinegar, and add a little sap-green to it; temper it neither too thick nor too thin; then soak your parchment in this colour thoroughly a whole night; rinse it afterwards in water, strain it immediately on a frame, and set it to dry; take clear varnish, lay it on both sides, set it in the sun to dry; after this cut the parchment out of the frame into leaves, as large as you please, and lay them in a book under press, to keep them fine and straight. The effect of this parchment is to make a small letter, when put over it, appear as big again; and it is a great preserver of the eyes, especially to those that read much by candle-light. The varnish must be prepared of linseed-oil, and boiled with frankincense, mastich, and sandarac.

If you would have the parchment of a clear, transparent, and white colour, only wash, strain, and varnish it, as above. If you would colour it yellow, steep your parchment, after it has been washed, in a yellow liquid, made of saffron; for which purpose, tie saffron in a thin linen rag, hang it in a weak ley, and warm it over a slow fire; and when you see the ley tintured yellow, it is fit for use.

For a transparent red.—Take brazil, as much as you will: put it into a hot ley, which is clear, and not too strong, and it will tincture the ley of a fine red; then pour to it about half an egg-shell full of clean wine; draw the parchment through the colour; and when it is as deep as you would have it, strain it as before.

For a blue.—Take Lombard indigo, grind it with vinegar on a stone, and mix sal ammoniac among it, to the quantity of a pea; with this wet your parchment, and proceed as has been directed for the green.

For a violet or purple Colour.—Temper two-thirds of the above red, and one-third of the blue, and use it as before directed.

For a black Colour.—Take Roman alum, beat it into powder, and boil it in rain-water to a fourth part; add Roman vitriol, or atrament, with some Roman galls, and boil them together: with this stain your parchment twice or three times over; and, when dry, lay the Spanish varnish over it.

N. B. With these transparent parchments you may make curious bindings. One sort, used at Rome, is made thus: lay the board or pasteboard over with leaf-gold, leaf-silver, staniel, metal-leaves, &c. then binding the parchment over it, it will give it an uncommon lustre and beauty.

Dr Lewis informs us, that, in order to render the ink durable on parchment, a thick piece of it should be steeped in water, with some oak-bark, for three or four days, and then pressed smooth and dried. When the surface of this parchment was pared off, and the internal part written upon,

the characters continued of a good black, while those made with the same ink, on unprepared parchment, were changed into a yellowish-brown. Vellum may also be treated in the same manner.

It is said, that writing upon parchments decayed by time, may be recovered, and rendered legible, by dipping the obliterated parchment into a vessel of cold water, fresh drawn from the well; let it be taken out in about a minute, and pressed between two papers, in order to prevent its crumpling up in drying. As soon as it is moderately dry, if it be not legible, repeat the operation two or three times.

PARCHMENT, Roll of. See ROLL.

PARCHOUR, in *Geography*, a town of Hindoostan, in the circar of Guntoor; 18 miles S. of Guntoor.

PARCHWITZ, a town of Silesia, in the principality of Liegnitz, and capital of a prefecturate, containing two Lutheran churches, and a Roman Catholic chapel, and also a manufacture of cloth; 10 miles N.E. of Liegnitz. N. lat. 51° 15'. E. long. 16° 20'.

PARCIEUX, ANTHONY DE, in *Biography*, a French mathematician, and member of the Academy of Sciences, was born in the diocese of Uzes in 1703. He taught the mathematics at Paris with great reputation, and died there in 1768. His works are “A Treatise of Trigonometry,” “Essays on the Probability of the Duration of Life,” and “Memoirs on the Practicability of bringing to Paris the Water of the River d’Yvette.” Of the tables of M. Parcieux on the probability of life, great use has been made by the writers on the doctrine of annuities. He had a nephew of the same name, who was educated at the college of Navarre at Paris, where he studied mathematics and philosophy, and, at the age of 24, gave public lectures. In 1779 he began a course of experimental philosophy, in the military school of Brienne; after which, he occupied the philosophical professorship at the Lyceum in Paris, where he died in 1798. He wrote an elementary book on Geometrical and Astronomical Calculations; and in his youth he is said to have composed a tragedy, entitled “Ozorio.”

PARCO FRACTO, or *Pound-break*, in *Law*, a writ which lies against him who violently breaks open a pound, and takes out beasts thence, which, for some trespass done, were lawfully impounded. See POUND.

PARCOL, or **PARCOUL**, in *Geography*, a lake of Thibet; 25 miles in circumference. N. lat 43° 22'. E. long. 92° 42'.

PARCOS, a town of Peru, in the diocese of Guamanga; 25 miles N.E. of Guancavelica.

PARCOU, a town of France, in the department of the Lower Charente; 12 miles E. of Montlien.

PARCOW, a town of Austrian Poland, in Galicia; 36 miles N.N.E. of Lublin.

PARDALIS, in *Zoology*. See *FELIS Pardalis*.

PARDALUS, in *Ornithology*. See *TRINGA Squatarola*.

PARDANTHUS, in *Botany*, so named by Mr. Ker, from *παρδος*, a panther, and *ανθος*, a flower; in allusion to the beautifully spotted tawny-coloured corolla. Ker (late Gawler) in *Ann. of Bot.* v. 1. 246. *Ait. Hort. Kew.* ed. 2. v. 1. 122.—Class and order, *Triandria Monogynia*. Nat. Ord. *Enfatæ*, Linn. *Irides*, Juss.

Gen. Ch. *Cal.* none, unless the bractæ be taken for spathas. *Cor.* of one petal, superior, wheel-shaped, regular, divided to the base into six equal segments, spirally twisted in decay. *Stam.* Filaments three, shorter than the corolla, inserted into the base of three of its segments, nearly straight, spreading; anthers oblong, vertical, somewhat approaching each

each other. *Pist.* Germen roundish; style thread-shaped, ascending, the length of the filaments; stigmas three, spreading, dilated, involute, two-lipped. *Peric.* Capsule obovate-oblong, coriaceous, obscurely triangular, of three cells and three valves, the valves at length revolute. *Seeds* numerous, globose, pulpy, inserted in three double rows upon the edges of a triangular, central, unconnected *receptacle*.

Ess. Ch. Corolla regular, divided to the base into six equal spreading segments. Capsule with many globose, pulpy seeds, inserted into a central, unconnected, triangular receptacle.

1. *P. chinensis.* Chinese Panther-flower. (*Ixia chinensis*; Linn. Sp. Pl. 52. Curt. Mag. t. 171. Gært. t. 13. Trew Ehret. t. 52. Moræa chinensis; Thunb. Mor. n. 19. Willd. Sp. Pl. v. 1. 245. Belamcanda chinensis; Redout. Liliac. t. 121.)—Native of the East Indies, China, and Japan. Hardy with us in the open ground, flowering in June and July. *Root* tuberous, perennial. *Stems* several, about three feet high, round, leafy, smooth, paniced at the summit. *Leaves* equitant, sword-shaped, pointed, striated, light green, about a foot long. *Flowers* several, terminal, erect, stalked, with sheathing tumid bractæas, very short-lived, inodorous, an inch and half wide, of a pale tawny orange, elegantly speckled with a deeper or reddish colour. This flower appears to be a favourite with the Chinese, and is often represented on their paper-hangings and screens.

PARDELA, in *Ornithology*. See PROCELLARIA *Capensis*.

PARDIES, IGNATIUS-GASTON, in *Biography*, a French Jesuit, and ingenious mathematician and philosopher. was born in Bearn in the year 1636. He entered the society of Jesuits when he was about the age of 16, and applied himself so diligently and successfully to his studies, that he was appointed tutor in polite literature, and composed many pieces in prose and verse, distinguished by delicacy of thought and elegance of style, while he was very young. The bent of his mind was, however, turned to philosophical and mathematical studies; and to these he devoted himself with so much ardour, that in a short time he made himself master of the principles of the Peripatetic and Cartesian philosophy, and became highly esteemed as a professor of them. Having displayed great skill in the speculative sciences, in different provinces, he was called to Paris, to be professor of rhetoric in the college of Lewis the Great. Here he acquired celebrity, and the most sanguine hopes were formed of him, which, however, were blasted by his early death in 1673, when he was only in the 37th year of his age. This melancholy event was attributed to a malignant disorder, which he caught while zealously discharging the duties of preacher and confessor at the Bicêtre, during the festival of Easter. He wrote with neatness and conciseness, and in a very good style. His principal works are "Horologium Thaummaticum Duplex;" "Dissertatio de Motu et Natura Cometarum;" "A Discourse on local Movement;" "Elements of Geometry;" "A Discourse concerning the Knowledge of Beasts;" "Statistics, or the Science of moving Forces;" "Description and Explanation of two Machines, for facilitating the Construction of Sun-dials." The greatest part of Pardies' works was printed in a collective form at the Hague, in 1691; and afterwards at Lyons, in 1725. He had a dispute with sir Isaac Newton, concerning his "New Theory of Light and Colours;" and his Letters are preserved in the Philosophical Transactions for the year 1672.

PARDISIUM, in *Botany*, Burm. Prodr. Fl. Capenf. 26. Juss. 190, is corrected by Linnæus in his copy

of Burmann into *Perdisium*. It seems on examination to be his own *Perdicium semiflosculare*, Sp. Pl. 1248, of which Jussieu had no suspicion.

PARDO, or PARDAO, in *Commerce*, a silver coin, and money of account, at Goa. A pardo is worth four good tangas, or five bad. The pardo is divided into 300 reas. The silver coins are the pardo xeraphim of five good tangas, and the common pardo of four good tangas.

PARDO, in *Geography*, a river of Paraguay, which runs into the Parana.

PARDON, in *Law*, a remission or forgiveness of a felony or other offence, against the king, or the laws.

This, our lawyers make twofold: the one, *ex gratia regis*; the other, *per cours de ley*. The first is that which the king, out of some special regard to the person, or some other circumstance, grants, by his absolute prerogative or power, either before conviction of the offender, or after.

This power of pardoning is the most amiable prerogative of the crown. It was said by our Saxon ancestors, (L.L. Edw. Conf. c. 18.) to be derived "a lege sua dignitatis;" and it is declared in parliament by statute 27 Hen. VIII. c. 24, that no other person hath power to pardon or remit any treason or felonies whatsoever; but that the king hath the whole and sole power thereof, united and knit to the imperial crown of this realm.

Judge Blackstone observes, that this is one of the great advantages of monarchy in general, above any other form of government; that there is a magistrate, who has it in his power to extend mercy, wherever he thinks it is deserved; holding a court of equity in his own breast, to soften the rigour of the general laws, in such criminal cases as merit exemption from punishment. Some theorists, however, maintain, that pardons should be excluded in a perfect legislation, where punishments are mild, but certain; because the clemency of the prince seems to be a tacit disapprobation of the laws. But the exclusion of pardons must necessarily introduce a very dangerous power in the judge or jury, that of construing the criminal law by the spirit instead of the letter (see Beccaria, ch. 4. and 46.); or else it must be holden, what no man will seriously avow, that the situation and circumstances of the offender, though they alter not the essence of the crime, ought to make no distinction in the punishment. In democracies, however, this power of pardon can never subsist; for there nothing higher is acknowledged than the magistrate who administers the laws; and it would be impolitic for the power of judging and of pardoning to centre in one and the same person. This, as Montesquieu observes, (Sp. of Laws, book vi. c. 5.) would oblige him very often to contradict himself, to make and unmake his decisions: it would tend to confound all ideas of right among the mass of the people; as they would find it difficult to tell, whether a prisoner were discharged by his innocence, or obtained a pardon through favour. In monarchies, the king acts in a superior sphere; and though he regulates the whole government as the first mover, yet he does not appear in any of the disagreeable or invidious parts of it. Whenever the nation sees him personally engaged, it is only in works of legislature, magnificence, or compassion. To him, therefore, the people look up as the fountain merely of bounty and grace; and these repeated acts of goodness, proceeding immediately from himself, endear the sovereign to his subjects, and contribute more than any thing to root in their hearts that filial affection, and personal loyalty, which are the sure establishment of a prince. In the exercise of this prerogative, however, the sovereign should be directed by a sound discretion and impartial judgment, and also by wise and upright counsellors;

fellors; and the occasions for the exercise of it should be rendered as few and unfrequent as possible, by mitigating the severity of our criminal laws, and lessening their number, and making the penalties annexed to the violation of them more definite and certain.

A pardon may be pleaded in arrest of judgment; in which case it has the same advantage, as when pleaded upon arraignment, *viz.* the saving the attainder, and of course the corruption of blood, which nothing can restore but parliament, when a pardon is not pleaded till after sentence. And certainly, on all accounts, when a man hath obtained a pardon, he is in the right to plead it as soon as possible.

With regard to the object of pardon, judge Blackstone observes, that the king may pardon all offences merely against the crown, or the public; excepting, 1. That, to preserve the liberty of the subject, the committing any man to prison out of the realm is, by the habeas corpus act, made a *præmunire*, unpardonable even by the king. Nor, 2. Can the king pardon, where private justice is principally concerned in the prosecution of offenders; therefore, in *appeals* (which see,) of all kinds, (which are the suit not of the king, but of the party injured,) the prosecutor may release, but the king cannot pardon. (3 Inst. 237.) Neither can he pardon a common nuisance, while it remains unredressed, or so as to prevent an abatement of it; though afterwards he may remit the fine. (2 Hawk. P. C. 391.) Neither, lastly, can the king pardon an offence against a popular or penal statute, after information brought; for thereby the informer hath acquired a private property in his part of the penalty. (3 Inst. 238.) Nor, farther, can the king's pardon be pleaded to any parliamentary impeachment, so as to impede the enquiry, and stop the prosecution of great and notorious offenders. It was enacted by the act of settlement (12 & 13 W. III. c. 2.), that no pardon under the great seal of England shall be pleadable to an impeachment by the commons in parliament. But after the impeachment has been solemnly heard and determined, it is not understood, that the king's royal grace is farther restrained and abridged.

As to the manner of pardoning, it must be under the great seal, and it is a general rule, that wherever it may be reasonably presumed the king is deceived, the pardon is void; so that any suppression of truth, or suggestion of falsehood, in a charter of pardon, will vitiate the whole; for the king was misinformed. (3 Inst. 238.) Generally, words have also a very imperfect effect in pardons. A pardon of all felonies will not pardon a conviction or attainder of felony, but these must be particularly mentioned. (2 Hawk. P. C. 383.) Nor will a pardon of felonies include piracy, which is not punishable at the common law. (1 Hawk. P. C. 94.) It is also enacted by 13 Ric. II. it. 2. c. 1. that no pardon for treason, murder, or rape, shall be allowed, unless the offence be particularly specified; and in murder it shall be expressed, whether it was committed by lying in wait, assault, or malice prepense.

A pardon may be conditional, or the king may extend his mercy upon what terms he pleases. (2 Hawk. P. C. 394.) It may also be observed, that a pardon, by act of parliament, is more beneficial than by the king's charter; for a man is not bound to plead it, but the court must *ex officio* take notice of it (Inst. 43.): neither can he lose the benefit of it by his own laches or negligence, as he may of the king's charter or pardon. (2 Hawk. P. C. 397.) The effect of such pardon by the king, is to make the offender a new man; to acquit him of all corporal penalties and forfeitures annexed to that offence, for which he ob-

tains pardon, and to give him a new credit and capacity. Blackst. Com. book iv.

PARDON by course of Law, is that which the king grants as the law and equity persuades, for a slight offence; as homicide, casual, &c.

PARDON, Charter of. See CHARTER.

PARDON for discovering Accomplices, &c. See APPROVER and DISCOVERY of Accomplices.

PARDON, in the *Canon Law*, is an indulgence which the pope grants to supposed penitents, for remission of the pains of purgatory, which they have merited for the punishment of their sins.

The grand time for the dispensation of pardons is the jubilee.

In this sense, pardon is properly the angelic salutation, said to the Virgin at the found of three little strokes of a bell, rung in the morning, at noon, and night, in order for the person to be entitled to indulgences.

PARDONERS, in our *Ancient Customs*, were persons who carried about the pope's indulgences, and sold them to the best bidders.

PARDOS, or *POMPENNY*, in *Geography*, a town of Africa, in the district of Anta, on the Gold Coast.

PARDOUX, St., a town of France, in the department of the Two Sevres; five miles S.S.W. of Partenay.

PARDOUX la Rivière, St., a town of France, in the department of the Dordogne, and chief place of a canton, in the district of Nontron; four miles S.E. of Nontron. The place contains 1273, and the canton 7860 inhabitants, on a territory of 217½ kilometers, in seven communes.

PARDUBITZ, a town of Bohemia, in the circle of Chrudim, situated on the Elbe, well-built and fortified, in which is a manufacture of knives and sword-blades; five miles N. of Chrudim. N. lat. 49° 55'. E. long. 15° 40'.

PARDUS, in *Zoology*. See *FELIS Pardus*.

PARDUS, in *Conchology*, a name given by authors to a kind of shells, of the genus of the volutæ. We have three kinds of this shell. 1. A voluta spotted with black. 2. Another spotted with yellow. And, 3. A very elegant one spotted with a reddish-colour. They are called *pardis*, or leopard-shells, from their distinct spots resembling those on the skin of a leopard.

PARÉ, AMBROSE, in *Biography*, a French surgeon of eminence, was born at Laval, in the district of the Maine, in the year 1509. He commenced the study of his profession early in life, and practised it with great zeal both in hospitals and in the army; in the latter he held an appointment, under the captain-general of infantry, in 1536. Subsequently his reputation rose very high, and he was appointed surgeon in ordinary to king Henry II. in 1552; and he held the same office under the succeeding kings, Francis II., Charles IX., and Hen. III. To Charles IX. especially he is said to have conferred great professional benefits, especially on one occasion, when some formidable symptoms had been produced by the accidental wound of a tendon in venesection, which he speedily removed. His services appear to have been amply acknowledged by the king; for as Paré was a Huguenot, he would have been included in the horrible massacre of St. Bartholomew's, had not the king sent for him on the preceding night, and ordered him not to leave the royal chamber. After having been long esteemed as the first surgeon of his time, and beloved for his private virtues, he died in the year 1590, at the age of eighty-one.

Paré was not a man of learning, and was even obliged to request a physician to make a French translation of some of the books of Galen, which he wished to consult. Nevertheless

thelſs there are an affectation of much learned reference, and numerous quotations from the ancients, in his writings, which have added nothing to his reputation. There is ſome juſtice in the remark of Van Hoorne, that Paré would have done better, if he had limited his publication to a ſmall volume, containing only the records of his own obſervation and experience. He muſt be conſidered, however, as a man of original mind, and a real improver of his art; and as having greatly facilitated and extended the application of ſeveral principles of practice, which, according to his own acknowledgment, he derived from the Italian writers and practitioners. Though he did not invent, he greatly promoted the practice of tying divided arteries, which he effected by drawing them out naked, and paſſing a ligature over them. He was the author of a great improvement in the treatment of gun-ſhot wounds, by adopting a lenient method, and rejecting irritants and cauterizations, which were employed by his contemporaries. He was alſo a bold and ſucceſſful operator, and records many inſtructive caſes, in which he diſplayed all the reſources of an enlightened ſurgeon. He did not, however, greatly excel in anatomy, though he had practiſed diſſections; and was chiefly a borrower from the works of Veſalius in this department of ſcience, though not without ſome obſervations of his own.

Paré was the author of ſome works, which were univerſally read and translated into moſt of the languages of Europe. His firſt treatiſe, "Manière de traiter les playes faites par harquebuſes, fleches, &c." was published at Paris in 1545, and again in 1552 and 1564. He afterwards laboured ſtrenuouſly to put his brethren in poſſeſſion of a body of ſurgical ſcience in their native tongue; and in 1561 published the firſt edition of his works, in folio. Numerous editions were afterwards printed at Paris and alſo at Lyons; and his pupil, Guillemeau, who was alſo ſurgeon to Charles IX. and Henry IV., translated theſe works into Latin. This translation has been frequently reprinted at various places, with the title of "Ambroſii Paræi, Opera, novis iconibus elegantiſſimis illuſtrata, et Latinitate donata." This volume contains twenty-fix treatiſes, and there is no branch of ſurgery which is not touched upon in the collection. Eloy Dict. Hiſt. Gen. Biog.

PARÉ, or PARÆUS, DAVID, a celebrated German Proteſtant divine of the reformed communion, was born at Francoſtein, in Sileſia, in the year 1548. He was put apprentice to a ſhoe-maker, but this ſituation did not repreſs the early inclination which the youth had diſcovered for learning, and at length his father permitted him to follow the bent of his inclination. At the age of ſixteen years he was ſent to Hirschberg, where was a college, of which Chriſtopher Schilling was the principal. By his tutor he was converted from Lutheraniſm, in which he had been educated, to the principles of the reformed church, on the ſubject of the *real preſence*, a circumſtance that involved the maſter and the pupil in conſiderable difficulties. In 1566 he was ſent, with ten of his ſchool-fellows, to Heidelberg, and they carried with them ſuch effectual recommendations from their common maſter, that they were all admitted into the college of Wiſdom, of which Zachary Uſinus, profeſſor of divinity, was director. At Heidelberg, Paré made great proficiency in all the branches of learning taught in that place, and in 1571 he was admitted to the miniſtry, in which he officiated many years with great reputation. In 1598, he was nominated divinity profeſſor of Heidelberg. He died in June 1622, and was buried with all the funeral honours which the univerſities of Germany are accuſtomed to beſtow on their moſt diſtinguiſhed members. He wrote ſeveral treatiſes againſt Bellarmine; and

commentaries on the ſcriptures. That on the epiſtle to the Romans, being translated into Engliſh, was burnt by order of James I. for containing ſeditious principles. He had a ſon, John Philip, who was born in 1576, at Hembach, in the dioceſe of Worms; and who ſtudied at Neuſtadt and Heidelberg. In 1610 he was made rector of the college at Neuſtadt, where he continued till the town fell into the hands of the Spaniards in 1622, on which occaſion his library was plundered. He died in 1650. He was author of "Lexicon Criticon;" "Lexicon Plautinum, or A Vocabulary to the Comedies of Plautus;" "Calligraphia Romana," and other works. He left a ſon, Daniel, who published "Melliſcium Atticum;" "Hiſtoria Palatina;" "Medulla Hiſtoriæ Eccleſiaſticæ."

PARÉ, in the *Manege*. To pare a horſe's foot is to cut his nails; *i. e.* the horn and ſole of his foot; which is done with a buttrefs in order to ſhoe him.

In England, the ſmith or farrier holds the horſe's foot between his knees, in which poſture he pares the foot, ſets on the ſhoe, drives the nails, and rivets them, and this all alone, without any aſſiſtance from the groom.

PARECALA, in *Geography*, a fertile province of the iſland of Luçon, rich in mines of gold and precious ſtones. The Spaniards receive tribute from about 7000 perſons.

PARECBASIS, παραβάσις, in *Rhetoric*, is uſed to ſignify the exaggeration of a crime, and not a digreſſion from the queſtion in hand, as ſome have thought.

PARECHAMPA, in *Geography*, a town of Bootan; five miles N. of Taſſafudon.

PARECHESIS, παραχρησις, in *Rhetoric*, the too frequent repetition of the ſame ſyllable, thus *perire me malis malim modis*.

PARECHIA, in *Geography*, a ſmall town of the iſland of Paros, built on the ruins of the ancient Paros, on the W. coaſt of the iſland, facing Antiparos; but it preſents no idea of the ancient city, unleſs by the beautiful ruins, which are employed equally without reſerve and without taſte in its conſtruction. Off Parechia, the ſea forms a bight, and a harbour, whoſe entrance is difficult, on account of the ſhoals by which it is obſtructed on the oppoſite coaſt. N. lat. 37° 5'. E. long. 25° 10'.

PAREDES, a town of Spain, in Aſturia; 25 miles N.W. of Oviedo.—Alfo, a town of Spain, in Leon; 13 miles N.W. of Leon.—Alfo, a town of Spain, in New Caſtile; eight miles N. of Siguença.

PAREDES, a town of Portugal, in Eſtramadura; 12 miles N.W. of Layria.

PAREDON *del Eſte*, a ſmall iſland near the N. coaſt of Cuba. N. lat. 22° 16'. W. long. 77° 80'.

PAREDON *del Medios*, a ſmall iſland near the N. coaſt of Cuba. N. lat. 22° 16'. W. long. 77° 50'.

PAREDRI, παραδρι, among the *Athenians*. When the archon, baſileus, or polemarchus, by reaſon of their youth happened not to be ſo well ſkilled in the laws and cuſtoms of their country as might have been wiſhed, it was cuſtomary for each of them to make choice of two perſons of age, gravity, and reputation, to fit with them upon the bench, and direct them as there was occaſion. And theſe aſſeſſors, or paredri, were obliged to undergo the ſame probation in the ſenate-houſe and public forum with the other magiſtrates; and like them too, to give an account how they had behaved themſelves in their reſpective truſts, when their office was expired.

PAREDRIA, a term uſed by Hippocrates to expreſs an aſſociation of two or more diſeaſes in the ſame patient, making, what we call, a complicated illneſs.

PAREGORICS, παραγορικα, formed of παραγορεω, *I apprehenſe*,

peafe, or mitigate, in Medicine, remedies which affuage pain. The fame with what we otherwife call anodynes and opiates.

PAREGORIC Elixir. See ELIXIR Paregoricum.

PAREJA, JUAN DE, in *Biography*, was a Mestizo, (a Spanish name given to thofe who are born of a Spanish father, and a mother a native Indian,) whose love for the art of painting was fuch, that though the flave of Velafquez, and employed by him to prepare his colours, and attend upon him while painting, yet he contrived in feeret to obtain very confiderable proficiency in the art. He died at the age of 60, in 1670.

PAREIRA BRAVA, the root of a plant which is a fpecies of Ciffampelos, growing in the Weft Indies, chiefly in Mexico and Brazil; formerly efteemed a fpecific for the cure of the ftone and gravel.

The name, which, in the original Portuguefe, fignifies *wild wine, or balfard wine*, bears a good deal of analogy to the plant which bears branches loaden with leaves perfectly like thofe of the vine; and which, like them, creep along walls and trees. The Portuguefe value this root on an equal footing with the ipecacuanha. Some druggifts call it, by corruption, *parada prava*.

The root has no remarkable fmell; but to the tafte it manifefts a remarkable fweetnefs of the liquorice kind, together with a confiderable bitternefs, and a flight roughnefs covered by the fweet matter. It gives out great part both of the bitter and fweet fubftance to watery and fpirituons menftrua; in evaporating the watery decoction, a confiderable quantity of refinous matter feparates, which does not mingle with the remaining extract, nor difsolve in water, but is readily taken up by fpirit; whence fpirit appears to be the moft perfect difsolvent of its active parts. Both the fpirituons tincture and extract are in tafte ftronger than the watery.

The Portuguefe were informed of the virtues of this root by the natives of the Brafil, who infufed it in water, which they drank freely in all obftructions of the urinary paffages; and on trial extolled it above all the medicines in ufe. According to Browne, it is ftill ufed with this intention by the negroes in Jamaica. Towards the end of the 17th century, fome of thefe roots were brought over to Europe by the Portuguefe, who recommended them to phyficians as the moft effectual remedy hitherto difcovered in all calculous and gravelly complaints, and various accounts of their efficacy werefoon after publifhed. The Portuguefe accounts were too exaggerated to gain credit with the judicious part of the world; but Mr. Geoffroy's experiments fet its virtues in a much modefter light, and yet fhewed them to be very great; and that the root deferved to be for ever continued in ufe in medicine, and reckoned among the moft valuable fimples. The Portuguefe pretended that it difolves the ftone in the bladder; but though this is not true, Mr. Geoffroy found that it was admirable for breaking the common weaker fabulous concretions in the kidnies and ureters; and that the taking it was always attended with the voiding of large quantities of gravel. He gave it alfo with great fuccefs to perfons afficted with ulcers in the kidnies and bladder, and whose urine was purulent, and at many times totally fuppreffed; thefe fuppreffions of urine were always cured by it, and their urine became lefs thick and purulent; many alfo were perfectly cured of thefe complaints by a courfe of it, with the addition of balfam of capivi toward the end of the courfe.

This property of the pareira brava, of difolving thick humours, gave Mr. Geoffroy an opinion of trying it in humorous afthmas; and thefe obftinate cafes often were greatly abated, and fometimes perfectly cured by it. The

ufual way of taking it was in decoction, fweetening it in the manner of tea. Of the root in fubftance he prefcribed from twelve grains to half a dram, and in decoction or infufion, two or three drams: this quantity of the root bruifed he directed to be boiled in a pint and a half of water, till only a pint remains, which is to be ftrained off, fweetened with a little fugar, divided into three portions, and drank as tea at intervals of half an hour. Mem. Acad. Par. 1710.

The facts alleged to evince the utility of the radix pareiræ bravæ in nephritic and calculous cafes, were principally thofe of Geoffroy, Helvetius, and Lochner. It has alfo been recommended in ifchuria, jaundice, afthma, and fome other chronic difeafes. The accounts given of the fuccefsful employment of this root by French writers induced phyficians to try its effects in this country; but British praftitioners have recorded no remarkable inftances of its efficacy; and as a proof of its being funk into difrepute, it has no place in our pharmacopeias. Lewis's Mat. Med. Woodville's Med. Bot.

PARELCON, in *Grammar*, a figure, whereby a word or fyllable is added to the end of another.

PARELLA, in *Geography*, a town of France, in the department of the Dora; 20 miles N. of Turin.

PARELLONES, a cluster of fmall iflands in the Spanish Main, near the coaft of Darien. N. lat. 9° 37'. W. long. 79° 30'.

PAREMBOLE, παραμβολή, in *Rhetoric*, a figure wherein fomething relating to the fubject is inferted in the middle of a period. All the difference between the parembole and parenthefis, according to Voffius, is, that the former relates to the fubject in hand, whereas the latter is foreign to it. An example of each we have in Virgil, and firft of the parembole.

“Æneas (neque enim patrius confistere mentem
Paffus amor) rapidum ad naves præmitit Achatem.”

The following is an inftance of the parenthefis:

“———— ipfique fuos jam morte fub ægrâ
(Di meliora piis, erroremque hoftibus illum)
Disciffos nudis laniabant dentibus artus.”

See PARENTHESIS.

PARENCEPHALIS, a name given by fome authors to the cerebellum.

PARENCHYMA, in *Anatomy*, is generally applied to the fubftance of glands, and denotes that part of them, which conftitutes the peculiarity of the organ, the bafis, which would remain, if the veffels and nerves were removed. It is often ufed more generally, and in application to other parts, and fignifies the arrangement of the general tiffues, which is common to all the body, and in which the peculiar matter producing the differences of the organs is depofited. See FIBRE.

PARENCHYMA of Plants. Dr. Grew gives the name parenchyma to the pith or pulp, or that inner part of a fruit or plant, through which the juice is fupposed to be diftributed.

This, when viewed with a microfcope, appears to refemble marrow, or rather a fponge, being a porous, flexible, dilatible fubftance.

Its pores are innumerable, and exceedingly fmall; receiving as much humour as is requifite to fill and extend them; which difpofition of pores it is, that is fupposed to fit the plant for vegetation and growth.

The parenchyma of roots is white at firft; but it changes its colour, in proportion as the root grows thicker. Thus

it becomes yellow in the root of the bastard rhubarb, and red in that of the bistort.

PARENT, PARENS, a term of relation, applicable to those from whom we immediately receive our being. See FATHER and MOTHER.

The duties of parents to legitimate children consist in three particulars; *viz.* their maintenance, their protection, and their education.

The first of these duties is a principle of natural law; its obligation results from their having been voluntarily instrumental in giving them existence, which existence they should endeavour, as far as in them lies, to support and preserve. Children have, therefore, a perfect right of receiving maintenance from their parents. Montesquieu observes (*Sp. of Laws*, b. xxiii. c. 2.) that the establishment of marriage in all civilized states is founded on this natural obligation of the father to provide for his children; for that ascertains and makes known the person who is bound to fulfil this obligation. Moreover, the affection of parents to their children, which is too powerful to be totally suppressed or extinguished by any deformity of person or mind, or by the ingratitude, rebellion, and wickedness of children, and the provision which nature has prepared in the person of the mother for the sustentation of the infant, concerning the existence and design of which there can be no doubt, are manifest indications of the divine will. We may hence infer the guilt of those, who run away from their families, and by mere idleness or drunkenness, throw them upon a parish, or leave them, at their death, destitute of that provision for their subsistence, which, by diligence and frugality, they might have laid up for them; and also of those, who refuse or neglect the care of their bastard offspring, abandoning them to a condition, in which they must either perish, or become burdensome to others; for, though it be often not properly regarded, the duty of maintenance, like the reason upon which it is founded, extends to bastards, as well as to legitimate children. The Christian scriptures have declared, in explicit terms, the obligation of this duty: "If any provide not for his own, especially for those of his own household, he hath denied the faith, and is worse than an infidel" (1 Tim. v. 8.), that is, he hath disgraced the Christian profession, and fallen short in a duty which even infidels acknowledge. We may further observe, that the municipal laws of all well-regulated states have taken care to enforce this duty. The civil law (*Ff.* 25. 3. 5.) obliges the parent to provide maintenance for his child; and if he refuses, "*judex de ea re cognoscat.*" It even carries this matter so far, that it will not suffer a parent at his death totally to disinherit his child, without expressly giving his reason for so doing, and there are fourteen such reasons enumerated (*Nov.* 115), which may justify such disinherison. If the parent alleged no reason, or a bad, or a false one, the child might set the will aside, "*tanquam testamentum inofficiosum,*" a testament contrary to the natural duty of the parent.

It is also a principle of law, as well as of nature, that every man is obliged to provide for those descended from his own loins. By 43 Eliz. cap. 2. the father, mother, grandfather, and grand-mother of poor impotent persons, shall maintain them at their own charges, if of sufficient ability, according as the quarter-sessions shall direct; and by 5 Geo. I. cap. 8. if a parent runs away, and leaves his children, the churchwardens and overseers of the parish shall seize his rents, goods, and chattels, and dispose of them towards their relief. But no person is bound to provide a maintenance for his issue, unless where the children are unable to work, through infancy, disease, or accident: and then is only obliged to find them with necessaries, the penalty on

refusal being no more than 20*s.* a month. (See *Jews*.) Our law has made no provision to prevent the disinheriting of children by will; but by the custom of London, formerly universal, the children of freemen are entitled to one third of their father's effects, to be equally divided between them; of which he cannot deprive them. Farther, a parent, by our laws, may protect his children by supporting them in their law-suits, without being guilty of the legal crime of maintaining quarrels (2 *Inst.* 564.); and a man may justify assault and battery in defence of the persons of his children. (1 *Hawk. P. C.* 131.) With regard to the education of children, parents are bound to perform this part of their duty in a manner suitable to their station in life. This is a duty obviously reasonable, and unquestionably important. If this duty be not discharged with proper attention and assiduity, children must be miserable, and probably will be vicious, when they grow up, either from want of the means of subsistence, or from want of rational and inoffensive occupation. Besides, a person left in this condition will be useless, and at the same time he will be generally mischievous to the community. So that to launch an uneducated child into the world, is injurious to the rest of mankind; it is little better than to turn out a mad dog, or a wild beast into the streets. In the inferior classes of the community, this kind of reasoning condemns the neglect of parents, who do not betimes inure their children to labour and restraint, and fit them, as they have ability and opportunity, for some honest employment, by which they may be preserved from beggary, vice, and infamy. The municipal laws of most countries seem to be defective in this point, by not constraining the parent to bestow a proper education upon his children. The charity of the well-disposed has provided assistance for those parents, whose lot is so hard, that they cannot by labour provide for their children the means both of subsistence and education; and although our laws are defective, yet in one instance they have made a wise provision for breeding up the rising generation; since by the statutes for apprenticing poor children, such children may be apprenticed out by the overseer, &c. (See *APPRENTICE*.) And, in the case of religion, all parents are under peculiar restrictions.

Among the Athenians, if the parent did not put his child into a way of getting a livelihood, the child was not bound to make provision for the parent when old and necessitous. In the middle orders of society, those parents are most reprehensible, who neither qualify their children for a profession, nor enable them to live without one; and those in the highest, who, from indolence, indulgence, or avarice, omit to procure for their children those liberal attainments, which are necessary to make them useful in the stations to which they are destined. A man of fortune, who permits his son to consume the season of education, in hunting, shooting, or frequenting horse-races, assemblies, or other unedifying, if not vicious diversions, defrauds the community of a benefactor, and bequeaths them a nuisance. As some preparation for future life is necessary for youth of every description, those who leave the education of their bastards to chance, contenting themselves with making provision for their subsistence, desert half their duty. Archdeacon Paley observes, that a reasonable provision for the happiness of a child in respect of outward condition, requires three things; a situation suited to his habits and reasonable expectations; a competent provision for the exigencies of that situation; and a probable security for his virtue. The two first articles will vary with the condition of the parent. A situation somewhat approaching in rank and condition to the parent's own; or, if that be not practicable,

ble, similar to what other parents of like condition provide for their children, bounds the reasonable, as well as (generally speaking) the actual expectations of the child, and therefore contains the extent of the parent's obligation. By virtue of this rule, a parent is justified in making a difference between his children, according as they stand in greater or less need of the assistance of his fortune, in consequence of the difference of their age or sex, or of the situations in which they are placed, or the various success which they have met with. Daughters, on account of their peculiar circumstance, which it is needless to specify, should be the particular objects of a parent's care and fore-sight; and as an option of marriage is not presented to every female who deserves it, especially in a country and at a period of time in which a licentious celibacy is fashionable with the men, a father should endeavour to enable his daughter to lead a single life with independency and decorum, even though he subtract more from the portions of his sons, than is agreeable to modern usage, or than they expect. A parent, having provided for the exigencies of his children's conditions, next considers how to satisfy their just expectations: and upon this principle he prefers the eldest son to the rest, and the sons to daughters; which constitutes the right, and the whole right of primogeniture, as well as the only reasons for the preference of one sex to the other. The preference of the first born, indeed, has one public good effect: that if the estate were divided equally among the sons, it would probably make them all idle; whereas, by the present rule of descent, it makes only one so; which is the less evil of the two. And on the part of sons it may be observed, that if the rest of the community make it a rule to prefer sons to daughters, an individual of that community ought to guide himself by the same rule, upon principles of mere equality. For as the son suffers by the rule in the fortune he may expect in marriage, it is but reasonable, that he should receive the advantage of it in his own inheritance. Indeed, whatever the rule be, as to the preference of one sex to the other, marriage restores the equality. And as money is generally more convertible to profit, and more likely to promote industry in the hands of men than of women, the custom of this country may properly be complied with, when it does not interfere with the very plain reason already explained. The actual expectations of children, together with the expediency of subjecting the illicit commerce of the sexes to every discouragement which it can receive, makes the difference between the claims of legitimate children and of bastards. But neither reason will, in any case, justify the leaving of bastards to the world, without provision, education, or profession: or, what is more cruel, without the means of continuing in the situation to which the parent has introduced them; which last is to leave them to inevitable misery.

After the exigencies of a child's situation are provided for, a parent may diminish his portion, in order to punish any flagrant crime, or to punish contumacy and want of filial duty in instances not otherwise criminal; for a child who is conscious of bad behaviour, or of contempt of his parent's will and happiness, cannot reasonably expect the same instances of his munificence. In case of vicious habits that are incorrigible, or of such a disposition to waste or misemploy the fortune put into his power, as if he were made an idiot, the parent may treat the child as such; and provide for his support by an annuity equal to his wants and innocent enjoyments, and which he may be restrained from alienating: and this, says Dr. Paley, is the only case in which a disinherison, nearly absolute, is justifiable. But in order to justify an inofficious disposition of his for-

tune, no parent should be allowed to plead, that "every man may do what he will with his own." For though his will, in this case, however capricious, will be valid; yet his conscience will not be absolved from the obligations of a parent. Nor, on the other hand, when he sits down to make his will, should any partialities for a favourite child over-rule and mislead more manly deliberations. When a parent, in order to make suitable provision for his children by frugality and industry, has gained a sufficiency for this purpose, the plea of children furnishes no just excuse for parsimony. A parent should consider, that children gain not so much as we are apt to imagine, in the chance of this world's happiness, or even of its external prosperity, by setting out in it with large capitals. With respect to those who have died rich, many began with little; and with regard to enjoyment, there is no comparison between a fortune, which a man acquires himself by a fruitful industry, or a series of successes in his business, and one found in his possession, or received from another. It remains to mention another principal part of a parent's duty, which is that of using proper precautions and expedients, in order to form and preserve his children's virtue. But this is a subject which is amply discussed under the several articles of EDUCATION.

The rights of parents result from their duties; and the authority with which they are invested, is given them, partly to enable them more effectually to perform these duties, and partly as a recompence for their care and trouble in the faithful discharge of them. The relation between a parent and his children infers no property in their persons, or natural dominion over them.

By the ancient Roman laws, the father had a power of life and death over his children; but the rigour of these laws was softened by subsequent constitutions. By our English laws, parental authority is much more moderate, but still sufficient to maintain order and obedience. A parent may lawfully correct his child, being under age, in a reasonable manner. The consent or concurrence of the parent to the marriage of his child under age was also directed by our ancient law to be obtained; but now it is absolutely necessary, and without it the contract is void. A father has no other power over his son's estate than as a trustee or guardian; for though he may receive the profits during the child's minority, yet he must account for them when he comes of age. He may, indeed, have the benefit of his children's labour while they live with him, and are maintained by him: but this is no more than he is intitled to from his apprentices or servants. Moreover, the legal power of a father (for a mother, as such, is entitled to no power, but only to reverence and respect) over the persons of his children ceases at the age of twenty-one. Yet, till that age arrives, this empire of the father continues even after his death; for he may by his will appoint a guardian to his children. He may also delegate part of his authority, during his life, to tutors and school-masters.

As it is necessary to determine the destination of children, before they are capable of judging of their own happiness, parents have a right to elect professions for them. Parents, having no natural dominion over their children, or property in their persons, have no right to sell them into slavery. Accordingly, the children of slaves are not, by the law of nature, born slaves; for as the master's right is derived to him through the parent, it can never be greater than the parent's own. Parents not only pervert, but exceed their just authority, when they consult their own ambition, interest, or prejudice, at the manifest expence of their children's happiness. Many instances might be mentioned of this abuse of parental power;

power; but some of them belonging to countries where Catholic establishments prevail, we shall select that of urging children to marriages from which they are averse, with a view of exalting or enriching the family, or for the sake of connecting estates, parties, or interests, or the opposing of a marriage, in which the child would probably find happiness, from a motive of pride or avarice, of family hostility, personal pique, or diversity of religious opinions. Blackst. Com. b. 1. ch. 16. Paley's Princ. of Moral and Political Philosophy, vol. i. ch. 9 and 10. See CHILD.

PARENT, ANTHONY, in *Biography*, was born at Paris in the year 1666. Great care was taken of his education, and at a very early period he discovered a strong propensity to the study of mathematics. At the age of fourteen, he accidentally met with a dodecahedron, upon every face of which was delineated a sun-dial, excepting the lowest, upon which it stood. Struck with the curiosity of these dials, he attempted to imitate them, and was led from the practice to investigate the theory, and in a short time he wrote a treatise upon "Gnomonics," which, though said to be extremely rude and unpolished, had the merit of being his own invention, as was a work on "Geometry," which he wrote about the same time. At the earnest desire of his relations, he entered upon the study of the law, as a profession for his life, but he no sooner completed his studies in that faculty, than he betook himself, with increased ardour, to those pursuits which accorded best with his genius and inclination. He attended very diligently the lectures of M. de la Hire and M. Sauveur, and as soon as he felt himself capable of teaching others, he took pupils; and fortification being a branch of study which the war had brought into particular notice, he was called upon frequently to teach the principles of that science. After some time, he began to entertain scruples about undertaking to teach a subject of which he had no practical knowledge, and communicated them to Sauveur, through whose interest he made two campaigns with the marquis d'Alegre, during which he had many opportunities to inform himself with respect to every species of knowledge on the subject. Upon his return to the metropolis, he spent his time in a continual application to the study of natural philosophy, and all the branches of the mathematics, both speculative and practical, to which he added that of anatomy, botany, and chemistry. His great talents, and indefatigable industry, enabled him to surmount the difficulties attendant on the acquisition of any science. In 1699, M. Fillau des Billetes having been admitted a member of the Academy of Sciences at Paris, with the title of their academician, nominated M. Parent for his *élève*, who particularly excelled in that branch of knowledge. It was soon discovered that he directed his attention to all the subjects that came before the academy, and that he was competent to the investigation of every topic which was recommended to their notice. His temper was however very bad, and he exposed himself to many disputes, which he carried on in a very acrimonious manner, and which was the cause, together with the want of perspicuity in his compositions, of the very limited circulation of his various pieces. In the year 1716, the king abolished the class of élèves, and on this occasion he made M. Parent an adjunct, or assistant member of the class of geometry. He lived, however, but a short time to enjoy the honour, being in the same year cut off by the small-pox, when he was about fifty years of age. Although he was of a very irritable disposition, he is said to have possessed great goodness of heart, and though his means were extremely limited, he devoted much of his income to acts of beneficence. He was author of a work entitled "Elements of Mechanics and Natural Philosophy." "Mathematical and

Physical Researches," a sort of journal, which first appeared in 1705, and which in 1712 was greatly enlarged, and published in three vols. 4to.; and "A Treatise on Arithmetic." Besides these, he was author of a great number of papers in the different French "Journals," and in the volumes of the "Memoirs of the Academy of Sciences," from the year 1700 to 1714, and he left behind him in manuscript many works of considerable research; among these were some complete treatises on divers branches of mathematics, and a work containing proofs of the divinity of Jesus Christ, in four parts. Moreri.

PARENT, in *Geography*, a town of Prussia, in Pomerelia: 10 miles N. of Marienburg.

PARENTALIA, in *Antiquity*, funeral obsequies: or the last duties paid by children to their deceased parents.

PARENTALIA is also used for a sacrifice or solemn service offered annually to the manes of the dead.

PARENTELA—*De parentela se tollere*, in *Ancient Customs*, signified a renunciation of one's kindred and family.

This was done in open court, before the judge, and in the presence of twelve men, who made oath, they believed it was done for a just cause.

We read of it in the laws of Henry I. After such abjuration, the person was incapable of inheriting any thing from any of his relations, &c.

PARENTHESIS, *παρενθεσις*, formed of *παρ*, *inter*, between, and *θεσις*, *position*, q. d. *putting between*, in *Grammar*, intercalary words inserted in a discourse, which interrupt the sense or thread, but which seem necessary for the fuller understanding of the subject. The politest of our modern writers avoid all parentheses, as keeping the mind in suspense, embarrassing it, and rendering the discourse less clear, uniform, and agreeable. Long and frequent parentheses are intolerable, especially in verse, which they ever render dull and languid, and like to prose.

The proper characteristic of a parenthesis is, that it may be either taken in, or left out, the sense and grammar remaining entire.

In speaking, parentheses are to be pronounced in a different tone; and in writing they are inclosed between brackets, (), to distinguish them from the rest of the discourse.

The character itself, whereby they are distinguished, is also called a parenthesis. See PARENBOLE.

PARENTIS-*de-Born*, in *Geography*, a town of France, in the department of the Landes, and chief place of a canton, in the district of Mont-de-Marsan; 33 miles N. of Tartas. The place contains 1440, and the canton 4213 inhabitants, on a territory of 632½ kilometres, in six communes.

PARENZA, a sea-port town of Istria, and see of a bishop. The town is well built on a rock, and has a harbour for large vessels; 35 miles S. of Trieste. N. lat. 45° 18'. E. long. 13° 40'.

PAREOLA, in *Ornithology*, a species of *Pipra*; which see.

PARER, in the *Manege*, a term formerly used as a command to stop, but now exploded; all the riding-masters, when they have a mind the scholar should stop the horse, calling out *hola*. See STOP.

PARERE, in *Commerce*, an Italian term, which signifies the advice or counsel of a merchant, or negotiant; because such a person, being consulted on any point, introduces his answer, in Italian, with *mi pare*, i. e. *I think, it seems to me*.

The method of negotiating, especially that of bills of exchange, being borrowed from the Italians, most trading cities, especially Lyons, retain the use of *pareres*; which

are the advices or opinions of merchants and negociants, and which serve as acts before notaries, when given by authority of a judge conservator, or at a particular consultation, for maintaining the right of the consulter.

M. Savary has an excellent treatise intitled, "Parere, on Avis et Conseils sur les plus importantes Matieres du Commerce;" containing the resolution of the most difficult questions relating to bankrupts and failures, bills of exchange, orders without date, or expression of value, bank-signings, renewing of bills of exchange, those drawn or accepted by women in behalf of their husbands, or during the minority of the drawer, &c.

PARERGA, *παρηγοια*, a term sometimes used in architecture, for additions, or appendages, made by way of ornament to a principal work.

It is sometimes also used in painting, for little pieces, or compartments, on the sides, or in the corners, of the principal pieces.

PARRES CURTIS, or *Pares Curie*, peers of the court, an appellation which, in all the feudal institutions, both here and on the continent, distinguished the vassals of the inferior lords, who were bound by their fealty to attend their domestic courts baron (which were instituted in every manor, or barony, for doing speedy and effectual justice to all the tenants), in order as well to answer such complaints as might be alleged against themselves, as to form a jury or homage for the trial of their fellow tenants.

PARE'SIS, from *παρηγυμι*, to relax, in *Surgery*, a palsy of the bladder, attended either with retention of the urine, or involuntary discharge of it.

PARE SSEUX, in *Zoology*, a name given by Gautier to the *BRADYPUS tridactylus*; which see.

PARETONIUM, in *Natural History*, the name of an earth anciently found on the shores of Egypt, Cyrene, and the island of Crete; and used by the ancients in painting.

It had its name either from a part of Egypt, near which it was gathered, or from the name of a town in that kingdom, where it was usually sold.

Vitruvius is of the first opinion, and Volaterrus of the other. Of late we have been taught to think it lost; but it is still common on most of the shores of the islands of the Archipelago, though not observed or regarded; and is truly a very heavy and tough clay, of a fine white colour, found in masses of different sizes, generally as soft as the softer clays within the strata; and, by rolling about on the beach in this state, it gathers up the sand, small shells, and other foulnesses we always find about it. It is most probable, that there are strata of it fine and pure in the cliffs there, and that the sea washes off masses of them in storms and high tides, which are what we find.

PARERAH, in *Geography*, a town of Hindoostan, in Oude; 8 miles N. of Bahraitch.

PARFAIT, FRANCIS, in *Biography*, was born at Paris in 1698, of a distinguished family, and died in 1753. His works are, 1. "A General History of the French Theatre," in 15 vols. 2. "A History of the ancient Italian Theatre," in two vols. 3. "A Dictionary of Theatres," in 7 vols. 4. Several dramatic pieces that were never acted.

PARGAS, in *Geography*, a small island in the gulf of Finland, near the coast of Sweden, with a town. N. lat. 60° 19'. E. long. 22° 7'.

PARGET, in *Natural History*, a name given to the several kinds of gypsum or plaster-stone, which, when slightly calcined, make what is called *plaster of Paris*, used in casting statues, in stuccoing floors and cieling, and on many other like occasions.

The word parget, though generally understood of all the

gypsums, is, however, by the workman principally applied to the two species which make up the first genus of that class, called by Dr. Hill the *pholides*. These are the Montmartre kind, and that of Derbyshire. See PHOLIS.

PARGETING, in *Building*, is used for the plaistering of walls; sometimes for the plaster itself.

Pargeting is of various kinds: as, 1. White lime and hair mortar laid on bare walls. 2. On bare laths, as in partitioning, and plain cieling. 3. Rendering the insides of walls, or doubling partition-walls. 4. Rough-casting on hearth-laths. 5. Plastering on brick-work, with finishing mortar, in imitation of stone-work; and the like upon hearth-laths.

PARGOIRE, St., in *Geography*, a town of France, in the department of the Herault; 14 miles S.S.E. of Lodeve.

PARGOW, a town of Hindoostan, in the circar of Gohud; 9 miles S.S.W. of Kooch.

PARHAM, a town of the island of Antigua, and legal port of entry; 5 miles W. of St. John's.

PARHELIUM, or PARHELION, formed from *παρηλα*, near, and *ἡλιος*, sun, in *Physiology*, a mock sun or meteor, being a part of the heavens strongly illuminated by the image of the sun, and appearing like another sun, but often coloured and drawn out to a considerable length, in the form of a tail.

The parhelia usually accompany the coronæ, or luminous circles, and are placed in the same circumference, and at the same height. Their colours resemble those of the rainbow; the red and yellow are on the side towards the sun, and the blue and violet on the other. Though there are coronæ sometimes seen entire, without any parhelia; and sometimes parhelia without coronæ.

The apparent size of parhelia is the same as that of the true sun; but they are not always round, nor always so bright as the sun; and when several appear, some are more bright than others. They are tinged externally with colours like the rainbow, and many of them have a long fiery tail opposite to the sun, but paler towards the extremity. Some parhelia have been observed with two, and others with three tails. These tails appear for the most part in a white horizontal circle, which generally passes through all the parhelia; and if it were entire, would go through the centre of the sun. Sometimes there are arcs of lesser circles, concentric to this, touching those coloured circles which surround the sun. They are also tinged with colours, and contain other parhelia. Parhelia are generally situated in the intersections of circles; but Cassini says, that those which he saw in 1683, were on the outside of the coloured circle, though the tails were in the circle that was parallel to the horizon. M. Æpinus apprehends, that parhelia with elliptical coronæ are more frequent in the northern regions, and those with circular ones in the southern. They have been visible for one, two, three, and four hours together; and in North America they are said to continue some days, and to be visible from sun-rise to sun-set. When the parhelia disappear, it sometimes rains, or there falls snow in the form of oblong spiculæ, as Maraldi, Weidler, Krafft, and others, have observed; and because the air in North America abounds with such frozen spiculæ, which are even visible to the eye, according to Ellis and Middleton, such particles have been thought to be the cause of all coronæ and parhelia.

Parhelia are sometimes double, triple, &c.

Aristotle observes, that two were seen in Bosphorus from morning to evening, though, in general, he observes, they are not seen, except when the sun is near the horizon.

Pliny

PARHELIUM.

Pliny relates under what confuls this phenomenon was ever seen at Rome.

In the year 1629, was seen at Rome, by Scheiner, a parhelion of four suns, and the same number was seen by M. Muschenbroeck at Utrecht; Gassendi says, that in 1635 and 1636, he often saw one mock sun; in 1661, Hevelius observed at Dantzic one of seven suns; and in 1666, another was seen at Arles, of six.

Phenomena of this kind have also been observed by M. de la Hire at Paris, in 1689, and by M. Cassini, in 1693; by Mr. Grey, in 1700; by Halley, in 1702; and Maraldi, in 1721.

The Roman phenomenon observed by Scheiner, is represented *Plate XVII. Optics, fig. 8*, in which A is the place of the observer, B his zenith, C the true sun, A B a plane passing through the observer's eye, the true sun, and the zenith. About the sun C, there appeared two concentric rings, not complete, but diversified with colours. The lesser of them, D E F, was fuller, and more perfect; and though it was open from D to F, yet those ends were perpetually endeavouring to unite, and sometimes they did so. The outer of these rings was much fainter, so as scarcely to be discernible. It had, however, a variety of colours, but was very inconstant. The third circle, K L M N, was very large, and all over white passing through, the middle of the sun, and every where parallel to the horizon. At first this circle was entire; but towards the end of the appearance it was weak and ragged, so as hardly to be perceived from M towards N.

In the intersection of this circle, and the outward iris G K I, there broke out two parhelia, or mock suns, N and K, not quite perfect; K being rather weak, but N shone brighter and stronger. The brightness of the middle of them was something like that of the sun, but towards the edges they were tinged with colours, like those of the rainbow, and they were uneven and ragged. The parhelion N was a little wavering, and sent out a spiked tail N P, of a colour somewhat fiery, the length of which was continually changing.

The parhelia at L and M, in the horizontal ring, were not so bright as the former, but were rounder, and white, like the circle in which they were placed. The parhelion N disappeared before K; and while M grew fainter, K grew brighter, and vanished the last of all.

It is to be observed, farther, that the orders of the colours in the circles D E F, G K N, was the same as in the common halos, namely, red next the sun; and the diameter of the inner circle was also about 45 degrees; which is the usual size of a halo.

Aristotle (*Meteor. cap. 3.*) was of opinion, that rainbows, halos, and mock suns, were all occasioned by the reflection of the sun beams in different circumstances, by which an imperfect image of his body was produced, the colour only being exhibited, and not his proper figure. The image, he says, is not single, as in a mirror; for each drop of rain is too small to reflect a visible image; but the conjunction of all the images is visible.

M. Mariotte accounts for the appearance of parhelia from an infinity of little particles of ice floating in the air, which multiply the image of the sun, either by refracting or breaking his rays, and thus making him appear where he is not; or by reflecting them, and serving as mirrors.

The known laws of reflection and refraction have given a handle for geometrizing on these phenomena; and M. Mariotte has determined the precise figure of the little icicles, and their situation in the air, the size of the coronæ, or cir-

cles, which accompany the parhelia, and the colours with which they are painted, by a geometrical calculus.

The hypothesis of Descartes, to account for that horizontal circle in which mock suns appear, has less probability than any of his conjectures. He supposes that a great quantity of frozen vapours, crowded together by contrary winds, form a prodigious cylinder, which reflects the light that falls from it on all sides, so as to exhibit that lucid appearance in all the surrounding clouds. M. Huygens, on applying his attention to these appearances, was soon sensible that they could not arise from such globules as formed the halos; yet since parhelia are always attended with halos, he was satisfied that their causes must be much alike. Considering, then, what other figures hail-stones might possibly have, besides a spherical one, he could find no other so simple as that of a cylinder; and, indeed, he had often observed, that snow did consist of several slender oblong particles, mixed with those of other shapes; and seeing that small globules were sufficient for the production of halos, he imagined that a great number of small cylinders, floating in the air, might produce similar appearances. He also remembered that Descartes had taken notice of certain small columns, or cylinders, which he had seen lying on the ground, the extremities of which were bounded with flat stars, consisting of six rays or points.

The large and white horizontal circle, in the Roman phenomenon, M. Huygens supposed to be produced by the reflection of the sun's rays from the outsidés of the upright cylinders; since, when the sun shines upon a great number of such cylinders, suspended in the air, a white circle must necessarily appear to pass through the sun, parallel to the horizon, and of the same breadth with that of the sun. This he shews very distinctly by a large figure of a cylinder, and by pointing out the progress of the sun's rays reflected from it. For every point of the sun's vertical diameter, as well as his centre, will illuminate a circle of cylinders, of the same apparent height as the illuminating point. It is observable that no thick clouds are seen in the air when these circles appear, but only such as are very thin, and scarcely visible. For in most of these observations the sky is said to have been very clear and serene, which very well agrees with this hypothesis; since these minute cylinders must constitute a very thin cloud, uniformly extended; through which the sun, and even the blue colour of the sky, may be seen.

M. Huygens supposes that the parhelia at K and N, (*fig. 8.*) are produced by the same upright cylinders which produce the great white circle; but not in the same manner as that was caused, *viz.* by simple reflection, but by means of two refractions, exactly in the same manner as halos are produced; the centre of the cylinder being snow, and the outer part ice. The interval between these parhelia, he says, will be greater, as the cylinder of snow is thicker in proportion to the whole cylinder; and because the sun appears brightest through those cylinders which are on the outsidés of the arch K N; and as this brightness decays gradually to a certain distance, it exhibits the appearance of a parhelion, with a tail always tending towards the white circle, and making it brighter as far as it extends. The tail N P, of the parhelion at N, is drawn out of this circle; but this was a mistake, as Hevelius observes; and though it is not said that the parhelion at K had any tail, yet it is plain that a certain part of the white circle was its tail, though but a dull one; because this parhelion is said to have been fainter than the other; and it appears, by the observations of Hevelius, and his own, that these parhelia, or mock suns, as well as paraselenæ, or mock moons, always have

PARHELIUM.

have tails. Lastly, the extraordinary brightness of these parhelia, which was said to rival that of the sun, he supposed, might easily be accounted for, by considering that every cylinder shines through its whole length; whereas, the round grains in the halo, or the rainbow, emit but little light; so that the cylinder may probably afford more light than ten of those round grains; and if there be great plenty of cylinders in the air, it is no wonder that those images of the sun should appear so bright.

He then proceeds to demonstrate his hypothesis, by an accurate consideration of the refraction of the rays of light through the sides of such cylinders as have been described; and he investigates the distance at which the parhelia must appear from the sun; shewing that it is so much the greater, as the internal cylinder of snow is thicker in proportion to the whole cylinder; and that this distance must become greater as the sun rises higher; and he subjoins a table of these distances, in proportion to any given altitude of the sun; from which it appears, that if a sufficient number of cylinders be placed one above another, (some of which are melted more and some less,) besides the collateral parhelia next the sun, two or more may appear farther from him, but still in the same white circle, which was also confirmed by the observations of Hevelius in 1661, and of Scheiner in 1630. It appears also, from the same tables, that while the cylinders remain in the same situation, as the sun rises higher the intervals between him and the two parhelia will increase, which was the very thing which he himself had observed. But a greater alteration of these intervals may happen, if the cylinders be more melted; and from hence might arise that very remarkable phenomenon, which is said to have appeared in the time of Augustus, when three suns were seen at the same time, all of which were soon contracted into one; which, he observes, would be effected by the warmth of the air melting the snow in the cylinders; by which means both the parhelia would draw nearer to the sun, till they coincided with it; at which time all the cylinders would be melted, and changed into round drops.

In the next place, our author proceeds to explain the cause of that corona in the Roman phenomenon, of which the sun is the centre. And here his former hypothesis concerning halos, he acknowledges, will not answer the purpose. For though, when small cylinders are produced in the air, it is probable that half-thawed globules are lodged there at the same time, for the production of coronas; yet it is difficult to conceive how they can be thawed in so exact a proportion, as to produce a corona that shall pass precisely through those very parhelia.

Neither, as he observes, can this appearance be produced by cylinders obliquely situated, but only by the round ends of upright cylinders. And to suppose the above-mentioned cylinders to be always terminated by plain bases, he says, is by no means agreeable to nature; for, since their tops and bottoms will be thawed, as well as their sides, and to the same degree quite round, the water at their extremities will necessarily assume a round figure; so that not only those upright cylinders which lie on each side of the sun, and produce the collateral parhelia, will transmit his rays to the eye; but also those that lie quite round beyond him, to a certain distance, which will, therefore, produce a corona.

To verify this hypothesis by experiment, he ordered a glass cylinder to be made with round ends; and, inclosing it in an opaque body of the same shape, he found that it did, in reality, refract the light in such a manner as would produce this appearance. Considering, therefore, the necessity there is for the cylinders being of this particular shape, in order that the rays, passing through their extremities, may

produce coloured circles, he did not doubt, but that these circles are those very coronas. Otherwise some irregular and ill-shaped circles would be seen.

Hevelius had remarked, that the circle which passes through the parhelia, frequently appears fainter above and below, and brightest next the parhelia. The reason of this M. Huygens thought to be very plain from his glass cylinder, since the rays which passed through the round tops and bottoms of them produced only a small round image of the sun, as round grains do; whereas those which passed towards the ends of the cylindrical surfaces, where they just began to turn round, were formed into a broader and brighter pencil, like those which produce the parhelia; and this must make the corona grow gradually brighter and brighter towards the parhelia, both above and below, and to be more intensely coloured.

Having explained the cause of this corona, he proceeds to account for the two parhelia L and M, which appeared in the back part of the great white circle. And these, he thought, were produced, not by the reflection, but by the refraction of the sun's rays in the upright cylinders. The inner opaque cylinders, he observes, are so far from contributing to the production of these parhelia, that they sometimes hinder their appearance. But yet this inner cylinder of snow is absolutely necessary, whether the outward shell that contains it be made of water or of ice; for, without the snow, the watery cylinders would be immediately changed into round drops, and the whole cylinders could not be ice, because then they could not be every where transparent, without supposing them to have been quite liquid before they were frozen, which is inconsistent with a cylindrical figure.

He then shews, that these back parhelia must be in the large white circle; and determines, geometrically, that the distance between them must be sixty degrees. Indeed, in Scheiner's scheme, the distance of these parhelia exceeds ninety degrees; but it was neither measured, nor estimated; nor, indeed, so much as mentioned, and therefore M. Huygens does not doubt but that it is drawn much too large. In the Roman phenomenon these parhelia are said to have been white, whereas, according to this hypothesis, they ought to have been coloured. M. Huygens supposes that the whiteness arose from the weakness of their light; on which account halos sometimes appear white, and sometimes also the lateral parhelia, as appears by the accurate observations of Keckelius. But that these back parhelia do sometimes appear coloured, is evident from the account we have of one in Mat. Paris's history; in which we are told, that, besides the true sun, four mock suns appeared red, in a great circle, of the colour of crystal. That two of these were back parhelia, is evident from the figure, though it may be faulty in other respects.

The scarcity of cylinders, M. Huygens supposes, may be the reason that, in many observations, these parhelia have not appeared, though the white circle was plain enough to be seen. But there is another circumstance which may hinder their appearance, *viz.* the inner cylinders of the back part of the white circle being too thick in proportion to the water that surrounds them. For then the rays, which should produce the parhelia, will be stopped; and he found, by calculation, that when the sun is twenty-five degrees high, if the diameter of the opaque cylinder bear a greater proportion to that of the whole, than 590 to 1000, no back parhelia can appear.

That the back parhelia in the Roman phenomenon appeared rounder than the lateral ones, M. Huygens supposes to arise from this circumstance, that though some cylinders

cylinders in the arc LM, which lie not far from L and M, do send some refracted rays to the eye, yet they are not so numerous as those which come from the cylinders at L and M; and, therefore, that these parhelia can have no tails that are far extended, like the lateral ones. Besides, the refractions through the cylinders that produced the back parhelia are more regular; for the rays are not confined in their course by the opaque cylinders within, but receive their directions from the refractions at the most exact figure and polish of the outward watery surface of the cylinders. For the dark cylinders within, not being exactly equal to one another, are the cause of the irregular and inconstant shape of the lateral parhelia. The reason of the fluctuating motion of the tail of the parhelion N, he supposes to be, that sometimes fewer, and sometimes more cylinders were carried into that place; which also accounts for the corona DEF being sometimes entire, and sometimes open below, and that the parhelion K grew brighter while N grew duller. The phenomenon observed in 1661 by Hevelius, exhibited in *fig. 9*, seems to comprise all the real varieties of this most magnificent spectacle, parts of which have often been seen separately. The greatest difference between this appearance and that at Rome, consists in the arcs QGR and THS, which are convex towards the sun, and which Huygens accounts for by cylinders lying in a horizontal situation. The parhelia in these inverted arcs, he says, are nothing more than the brightest parts of them; and therefore they never appear quite distinct, nor much brighter than the adjoining parts of the arcs. Accordingly, Hevelius, in all his observations of this kind, took notice, that they appeared rather dull, heavy, and faint; and he was not sure whether there was a parhelion at H, or not. The reason why the middle part of the arc should appear a little distinct from the rest, he supposed to be this, that though there be great plenty of horizontal cylinders in the air, yet they may be so short, as to have but little of a cylindrical surface, or perhaps may be like oblong spheroids. Besides, it is perfectly agreeable to the observations of Hevelius, that the higher the sun or moon, and consequently the more the coronas are elevated above the horizon, the flatter these inverted arcs appear. It is confessed by M. Huygens, that the upper parts of these arcs are represented by Hevelius as being much less than his calculations require them to be; but he imagines that the sight of the observer was imposed upon, by the arcs being so much elevated above the horizon; in consequence of which they would appear to be parts of much lesser circles than they really are.

M. Muschenbroeck says, that nothing has been advanced concerning the cause of parhelia, more probable than the hypothesis of M. Huygens, except that frozen cylinders or spiculæ are always found transparent, and are never opaque at the centre. The coloured arcs that accompany parhelia, he thinks, to be not at all different from the common coronæ, so that if there be a quantity of icy spiculæ in a thin fog, the whole of this appearance will be produced, the coronæ being formed in the fog, and the parhelia in the spiculæ. See Huygen's Dissertation on this subject in Smith's Optics, book i. chap. 11. See also Priestley's Hist. of Light, &c. p. 613, &c. and Muschenbroeck's Introduction, &c. vol. ii. p. 1038, &c. quarto.

PARHOMOLOGÿ, *παρρομολογία*, in *Rhetoric*, a figure wherein a part is yielded to the opponent, and the rest denied: thus, "Sume hoc ab iudicibus nostrâ voluntate: nomen illi propiorem cognatum quam te fuisse, concedimus: officia tua nonnulla in illum exitisse, stipendia vos unâ secisse

aliquamdiu nemo negat; fed quid contra testamentum dicis, in quo scriptus hic est." See CONCESSION.

PARIA, or NEW ANDALUSIA, in *Geography*, a province of South America, in the government of Caraccas, formerly a part of Spanish Guiana, situated E. of Cumara, on the N. coast of the continent of South America. Between it and the island of Trinidad is a large bay, called the "Gulf of Paria;" 80 miles long, and from 30 to 40 broad.

PARIA, a town of South America, and capital of a district in the viceroyalty of Buenos Ayres, commencing 210 miles N.W. of that city, and about 120 miles in extent. The air is so cold, that the country produces little grain, but this deficiency is compensated by its abundance of all kinds of cattle: the cheefe that is made here, from the milk both of sheep and cows, is in high estimation, and sent into every part of Peru. Here are also some silver mines; 18 miles S. of Oruro. S. lat. 18° 50'. W. long. 68° 20'.

PARIAN CHRONICLE. This venerable relic of Grecian literature is occasionally called, Marmor Chronicon, Marmor Chronologicum, Parium Chronicon, Marmor Epocharum, Stela Epocharum, or the Arundel Marble. (See ARUNDELIAN MARBLES.) It was, in its perfect state, a square tablet of coarse marble, five inches thick; and when Selden first inspected it, measured three feet seven inches, by two feet seven. The upper part was then imperfect, the lower corner on the right hand having been broken off, which reduced that side of the marble to two feet eleven inches. On this stone were engraved some of the principal events in the history of ancient Greece, forming a compendium of chronology during a series of 1318 years, which commenced with the reign of Cecrops, the first king of Athens, B. C. 1582, and ended with the archonship of Diognetus.

It originally contained about one hundred lines, each consisting, on an average, of sixteen words, or one hundred and thirty letters; so that the whole might have been comprised in six octavo pages. This venerable monument of antiquity was purchased, with many others, by Mr. W. Petty, who was employed by the earl of Arundel, in the year 1624, for the purpose of collecting marbles, books, statues, and other curiosities, in Italy, Greece, and Asia Minor. It appears to have been dug up in the island of Paros, and was purchased at Smyrna. When brought to England in 1627, it was placed in the gardens belonging to Arundel-House, the site of which is now occupied by Arundel, Norfolk, Surry, and Howard-streets in the Strand. The next morning, it was examined, with eager curiosity, by some of the most distinguished literati of that time. These were sir R. Cotton, Selden, Patrick Young, and Richard James. After much labour it was decyphered, and a copy of it published by the learned Selden in the year 1628, accompanied with a Latin translation and commentary.

During the civil wars, and the subsequent usurpation of Cromwell, this rare monument of ancient literature was unfortunately broken into smaller fragments, and almost entirely defaced. The upper part, containing nearly half the original tablet, is said to have been used in repairing a chimney-piece, or hearth, in Arundel-House; but luckily the inscription, or at least as much of it as could be made out, was preserved in the copy, which Selden had previously taken and published. In the year 1667 the remaining fragments were presented by the Hon. Henry Howard, grandson of the first collector, to the university of Oxford, and deposited in the public schools, where they still remain.

The genuineness of this valuable relic of antiquity was universally acknowledged throughout all Europe, as soon

PARIAN CHRONICLE.

as its contents were made known: its authority has been considered as equal, if not superior, to any other, and writers of the first eminence have derived the greatest advantage from it in their historical and chronological researches. It was not till the year 1788, that its authenticity was impeached by a man of considerable learning and industry, in an elaborate volume, called "A Dissertation on the Authenticity of the Parian Chronicle." The author was the Rev. John Robertson, who founded his doubts and objections on the following considerations:

1. The characters have no certain, or unequivocal marks of antiquity.
2. It is not probable that the Chronicle was engraved for private use.
3. It does not appear to have been engraved by public authority.
4. The Greek and Roman writers, for a long time after the date of this work, complain that they had no chronological account of the affairs of ancient Greece.
5. This chronicle is not once mentioned by any writer of antiquity.
6. Some of the facts seem to have been taken from authors of a later date.
7. Parachronisms appear in some of the epochs, which we can scarcely suppose a Greek chronologer, in the 129th Olympiad, would be liable to commit.
8. The history of the discovery of the marbles is obscure and unsatisfactory; and
9. The literary world has been frequently imposed upon by spurious books and inscriptions; and therefore we should be extremely cautious with regard to what we receive under the venerable name of antiquity.

These observations are made the subject of separate chapters and disquisitions, and are illustrated with an appearance of much candour and extensive erudition; and, for a short time, the credit of the Parian Chronicle was shaken in the public opinion: but early in the following year, a vindication of it was undertaken by a writer of equal learning and certainly of superior judgment. This was the Rev. J. Hewlett, B. D. who is well known to the public as the author of three volumes of sermons, that have been much approved, and as the editor of a classical and elaborate edition of the bible, with a comment and notes, which will afford very important and useful instruction to every person who wishes to acquaint himself with the sacred writings.

Other writers followed Mr. Hewlett on the same side; but their arguments had for the most part been anticipated by him, or illustrated with additional learning and sagacity of criticism. It would exceed our limits to enter minutely into this controversy; but our readers may expect to have the summary arguments of the vindication laid before them in the correspondent order of the dissertator's doubts and objections.

With respect to the first, it is truly said, that mere characters can have no certain, or unequivocal marks of antiquity; but that those of the Parian Chronicle bear a general resemblance to such as appear on the coins of that age, and the most genuine monuments of antiquity, without being a slavish imitation of any; and that a singular mode of notation is adopted, which is explained only in an obscure tract of Herodian; but which occurs in no other author.

With respect to the second observation, it is remarked, that there is no improbability in supposing the Parian Chronicle to have been engraved by a private person. Monuments on different subjects have been engraved and erected by individuals; such are the Apotheosis of Homer; the Tabula Iliaca; and, particularly, the Marble Tables discovered at Palestrina, on which Verrius Flaccus had a corrected calendarium engraved.

As to the third remark, it is only necessary to observe, with Mr. Hewlett, it does not appear that the Parian Chronicle was *not* engraved by public authority, and that, in either case, its authenticity cannot be affected by the present supposition.

In answer to the fourth, it is shown that the Greek and Roman writers, for a long time after the date of this work, do not complain of their having *no* chronological account of the affairs of ancient Greece: they only complain, that there was not any *authentic* and *consistent* chronology of those ages; a complaint which still exists.

In reply to the fifth article, Mr. Hewlett observes, that though this Chronicle is not mentioned by any writer of antiquity, yet there are abundant reasons to prove, that the ancients could have no motive, or fair opportunity, for mentioning it. The remains of ancient literature, in which any notice of a small chronological tablet could be expected, are extremely few and imperfect; besides, it was not the practice of the ancient writers, as we learn from Pliny and others, to quote authorities, with any accuracy; and no writer who flourished before the Christian era, would appeal to so short a compendium of chronology as the Parian Chronicle was, cut on stone, and erected in the little island of Paros, when he could refer to the voluminous collections of Timæus Siculus, Eratosthenes, Apollodorus, Julius Africanus, and others. Much stress has been laid on the omission of Archilochus, who was a native of Paros, in a chronological monument, that was evidently calculated to mark and record the progress of literature and science: but professor Wagner has shown, that the name of the Parian satirist ought to have been inserted under the proper epocha, where the commentators have arbitrarily filled up the lacunæ on the marble with an event of no importance. Vide Epoch. P. 34.

With regard to the sixth assertion of the dissertator, it is confidently affirmed, after a minute and critical investigation of the subject, that there are no facts in the Parian Chronicle, which seem to have been taken from authors of a later date.

On the seventh, the result of Mr. Hewlett's disquisition is, that if there really are parachronisms in some of the epochs, the authorities opposed to the Parian Chronicle are extremely doubtful; and that the circumstance of its differing from the few remaining authors of antiquity, in some particulars, is rather an internal proof of its authenticity. After all, no one in vindicating the genuineness of this venerable relic of Grecian literature, ever dreamed of proving its infallibility, any more than that of any other chronologist.

In answer to the eighth objection, it is remarked, that the history of the discovery of the Parian Chronicle, upon the whole, is not unsatisfactory, or obscure; since the commentators, critics, and historians, who have had occasion to mention it, and who had a clear idea of what it was, agree as to the time and place of its discovery, and with regard to the person who procured it. And though we are not precisely informed of the sum which was paid for it, (because it formed a part of a collection,) nor are furnished with a full account of the particular circumstances under which it was purchased; yet this must necessarily have proceeded from the negligence and inadvertence, and not the ignorance, or doubts, of the first editor. It is sufficient, that no just ground of fraud, or suspicion, attaches to any of the parties in the whole of the transaction.

With respect to the ninth remark, it is said, that though the literary world has frequently been imposed on by spurious books and inscriptions, yet spurious books apply not to the

present question; and as to inscriptions, there is nothing to be found in the whole history of impostures, that bears the least resemblance in point of learning, labour, and expence, to the Parian Chronicle.

In addition to these remarks, let it be observed, says Mr. Hewlett, that very few men, since the revival of learning, have been capable of executing such a literary monument as the Parian Chronicle. Of these few, not many, it is hoped, would have had the baseness to attempt it; and others might have been justly withheld from doing it, by the labour of the undertaking, and the danger of detection; since it would require three months to cut the characters only; and, in executing such a project, it is scarcely possible, that many persons should not be privy to it, and that the author should not be guilty of some error, or meet with some untoward circumstance, that would have betrayed the imposition to such a man as Mr. Petty, who purchased it, and who is represented by Selden, Dr. Chandler, and others, as a person of the greatest judgment and discernment, and no less distinguished for his learning.

Farther, on the supposition of its being a forgery, it does not appear that the impostor received any adequate compensation for his trouble; and, as no ostensible author was held forth, the vanity of learning could not be gratified, for a moment, by the excellence of imitation, or any successful competition with works of departed genius; motives which appear to have been general with the impostors of antiquity, and no less prevalent among those of modern times. Besides, it is not at all probable, that the fabricator of such an inscription would have broken it to pieces and defaced it, in the manner that it was when Mr. Petty purchased it, unless, like the rest of his fraternity, he had contrived some prudent means of being the restorer of his own monument, and the interpreter of his own mysteries.

Such are the mere heads of the arguments advanced by the learned and successful vindicator of this valuable monument of ancient literature; arguments which are illustrated and enforced with varied and extensive erudition, and great diligence of research, combined with much critical acumen, that is displayed in detecting fallacies, exposing errors, and refuting objections. It is remarkable, that on the appearance of this masterly vindication, the controversy almost instantly ceased; and the respectable author of it has had the satisfaction of seeing the Parian Chronicle re-established on the same solid basis, on which it had always rested from the time of its first discovery.

Parian Marble. See MARBLE.

PARIANA, in *Botany*, a name of Aublet's, which, as Professor Martyn remarks, seems to have been suggested by the flowers growing in pairs upon the spike. *Aubl. Guian. v. 2. 876. Schreb. 650. Willd. Sp. Pl. v. 4. 492. Mart. Mill. Dict. v. 3. Juss. 34. Lamarck Dict. v. 5. 13. Illustr. t. 776.*—Class and order, *Monoclea Polyanthia*. *Nat. Ord. Gramina*.

Gen. Ch. Male, *Cal.* Glume of two short acute valves, containing a single floret. *Cor.* of two ovate acute valves, larger than the calyx; one of them narrower than the other. *Stam.* Filaments about forty, capillary, inserted into the base of the corolla; anthers linear.

Female, solitary in the same whorl, *Cal.* Glume of two ovate, concave, acute valves, containing a single floret. *Cor.* of two acute valves, hairy at the summit, smaller than the calyx. *Pist.* Germen superior, triangular; style long, hairy; stigmas two, villous. *Peric.* none, except the permanent corolla. *Seed* solitary, triangular, invested with the glumes.

Eff. Ch. Male, Calyx of two valves. Corolla of two

larger valves. Stamens forty, inserted into the base of the corolla.

Female, Calyx of two valves. Corolla of two smaller valves. Style hairy. Stigmas two. Seed one, triangular.

1. *P. campestris.* *Aubl. Guian. 877. t. 337.*—Gathered by Aublet in woods and by way-sides in Cayenne, flowering in January. The root is perennial. Stems several, reedy, a foot or two in height, simple, knotty, leafy. Leaves solitary at each joint, ovals, broad, pointed, entire, many-ribbed, smooth; paler beneath; sheaths long, striated, closely enveloping the stem, bearded at the summit with copious long reddish hairs, and contracted suddenly below the leaf, into a sort of slender, short footstalk, accompanied by a pair of membranous fringed stipules. Spike terminal, solitary, erect, about two inches long, dense, whorled, each whorl consisting of two pair of male flowers, with a solitary one, and a single female flower in the centre between them. The great number of stamens is very extraordinary in the natural order of grasses, to which this plant belongs.

PARIA-TUBA, in *Geography*, a town of Brazil, in the government of Para, on the river Amazons; 35 miles S.W. of Pauxis.

PARIDSONG, or *PHARI*, a strong town and mountain of Bootan, on the borders of Thibet; 40 miles N.W. of Tassifudon. N. lat. 28°. E. long. 89° 13'. The fortress of Phari is a strong stone building, situated on high ground; and on the N. and W. sides of it is an extensive suburb; on the S. is a large basin of water; and on the E. a bank of earth projected to a considerable distance, and falling with an easy slope from a level with the rampart into the plain. The valley of Phari is very extensive, being not less than ten miles long and four broad, surrounded on all sides with rocky hills. At the foot of the rocks, on the west border of the plain, is a large brook, flowing towards the south, called "Mahatchieu," which is said to have a passage, through the hills of Nipal, into Bengal. This is the station of Phari Lama, a dependant of Teshoo Loomboo, who is here a little potentate, being superintendent of a goombah, or monastery, and governor of a most extensive range of rocks and deserts, which yield verdure only in the mildest season of the year, when his neighbourhood is frequented by large herds of the long-haired, bushy-tailed cattle. From his character and station, he has great influence among the herdsmen. The musk-deer, which produce a valuable article of revenue, abound in the vicinity of these mountains. The musk-deer are deemed the property of the state, and hunted only by the permission of government; and of course a great part of the musk, which is a secretion formed in a little bag, or tumour, resembling a wen, situated at the navel, and found only in the males, passes through the hands of its agents. It is liable to much adulteration; but that which bears the regent's seal may be regarded as genuine. The musk-deer, in the language of Thibet, is called "La;" and the vascular covering of the musk, "Lacha." Turner's Tibet.

PARIESOVATZ, a town of Croatia; 15 miles S. of Bibacs.

PARIETALIA OSSA, in *Anatomy*, two bones of the cranium. See CRANIUM.

PARIETARIA, in *Botany*, so named from *paries*, a wall, in allusion to the place of growth of the most common species, which is uniformly on old ruins, or mouldering, flint walls. *Linn. Gen. 544. Schreb. 724. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 189. Ait. Hort. Kew. ed. 1. v. 3. 429. Tournef. t. 289. Juss. 404. Lamarck Dict. v. 5. 13. Illustr. t. 853. Gært. t. 119.*—Class and order, *Polygamia Monoclea*, *Linn. and Schreb. Tetrandria Monogynia*, *Smith. Nat. Ord. Scabridæ*, *Linn. Urtica*, *Juss.*

Gen.

PARIETARIA.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, four-cleft, flat, obtuse, half the size of the involucre. *Cor.* none. *Stam.* Filaments four, awl-shaped, longer than the flowering perianth, elastic, permanent; anthers twin. *Pist.* Germen superior, ovate; style thread-shaped, coloured; stigma pencil-shaped, capitate. *Peric.* none, except the elongated, enlarged, bell-shaped perianth, whose mouth is closed by the inflexed segments. *Seed* solitary, ovate, polished.

Obs. The class *Polygamia* having been much curtailed by Dr. Smith, we have followed him in removing this genus to *Tetrandria*. It may be remarked however that some of the flowers are female, and in these the calyx undergoes no change.

Ess. Ch. Calyx four-cleft, inferior. Corolla none. Stamens elastic. Seed solitary, inclosed by the elongated calyx.

1. *P. indica*. Indian Pellitory. Linn. Mant. 128. Syft. Veg. ed. 14. 908. (*Cratægonum majus*; Rumph. Amboin. v. 6. book 10. 25. t. 10?)—Leaves lanceolate. Stem erect.—Native of India. The appearance of this species is very similar to the following one, but the whole herb is more naked. *Leaves* with much longer points, three-nerved and naked. *Flowers* in smaller heads. *Bractæas* awl-shaped, not ovate. *Styles* longer. *Fruit* sessile, furrowed. Linnæus once took the plant of Rumphius above quoted for a *Spermacoce*, but the description of the seed seems to prove it a *Parietaria*, though the opposite, nearly sessile leaves make us rather suppose that this synonym belongs to *P. zeylanica*, which is now, as well as *P. microphylla*, referred to *Urtica*.

2. *P. officinalis*. Pellitory of the Wall. Linn. Sp. Pl. 1492. Engl. Bot. t. 879. Curt. Lond. fasc. 4. t. 63. Fl. Dan. t. 521. (Ἐλξίον; Diof.)—Leaves lanceolate-ovate, without lateral ribs at the base. Segments of the involucre ovate. Stem ascending.—Native of Britain, on mouldering walls, chiefly in sheltered places, being rather impatient of cold; common in the south of Europe. It flowers abundantly through the summer and autumn. *Root* perennial. *Stem* branched, spreading, reddish, shining, leafy, juicy. *Leaves* alternate, elliptic-lanceolate, oblique, pointed, pale beneath, the lateral nerves all springing from the main rib considerably above the base of the leaf, in which it especially differs from *judaica* and *indica*. Each *involucre* is cut into seven ovate segments, and contains three fertile flowers; the central one female. The elastic *stamens*, which spring from the *calyx* forcibly when touched, scatter the pollen by that means all around.

The mucilaginous qualities of this plant have led some writers on the *Materia Medica*, to regard it as an emollient, but in this respect it is inferior to the Mallow tribe. Curtis remarks, on the authority of Aurelius Victor, that Constantine bestowed on the emperor Trajan the name of *Parietarius*, because his statues and his inscriptions, like that herb, were found on all the walls of Rome. Bradley recommends the Pellitory to be laid on the corn in granaries, for the purpose of driving away that destructive insect the weevil.

3. *P. judaica*. Basil-leaved Pellitory. Linn. Sp. Pl. 1492. Villars. Dauph. v. 2. 346. (*P. minor*, *ocymi folio*; Tourn. Inst. 509. Bocc. Sic. 47. t. 24. f. A.)—Leaves ovate. Stems ascending.—Native of Italy, France, Switzerland, Greece, and Palestine. Very similar in habit to the last, but different in having shorter *stalks*, and smaller, oval *leaves*. *Flowers* in rather smaller clusters.

4. *P. lusitanica*. Chickweed-leaved Pellitory. Linn. Sp. Pl. 1492. (*P. lusitanica annua minima*; Tourn. Inst. 509. *P. ficula alfinæ folio*; Bocc. Sic. 47. t. 24. f. B.)—Leaves ovate, obtuse. Stems thread-shaped, striated, even,

procumbent.—Native of Spain and Portugal. Introduced at Kew in 1771, by M. Richard, where it flowers in July. *Root* annual, according to Tournefort, though Boecone says it differs only from the last, and *officinalis*, in the *leaves*, which are very much smaller, and of the form and size of Chickweed.

5. *P. urticifolia*. Nettle-leaved Pellitory. Linn. Suppl. 434. Syft. Veg. ed. 14. 908.—Leaves opposite, stalked, ovate, ferrated, veiny, downy. Flowers axillary.—Found by Commerçon in the Island of Bourbon, hanging from the rocks, in repeatedly branched leafy tufts. *Leaves* hardly an inch long, alternate, stalked, ovate, rough, strongly ferrated, with an elongated blunt point. *Flowers* small, in minute axillary panicles.

6. *P. cretica*. Cretan Pellitory. Linn. Sp. Pl. 1492. Sm. Prodr. Fl. Græc. v. 1. 106. Fl. Græc. t. 154. (*P. cretica minor*, *capsulis feminum alatis*; Tourn. Cor. 38.)—Leaves nearly ovate. Involucre when in fruit lateral, two-lipped, tubular at the base; outer lip very large.—Found originally by Tournefort, and afterwards by Dr. Sibthorp, on the rocks of Crete and Cimoli. Time of flowering not recorded. *Root* perennial? fibrous, simple at the upper part, round. *Stems* numerous, very diffuse, a span long, branched, round, hairy, reddish, leafy. *Branches* short, alternate. *Leaves* alternate, stalked, ovate or roundish, obtuse, entire, veiny, hairy, dark-green; dotted with minute tubercles on the upper side. *Stalks* half as long as the leaves, hairy. *Flowers* axillary, sessile, three together, the middle one female.

7. *P. capensis*. Cape Pellitory. Thunb. Prodr. 31.—Leaves opposite, ovate, ferrated. Branches diffuse.—Native of the Cape, and adopted entirely on the authority of Thunberg's Prodomus. We are not acquainted with either a figure or description of this species.

8. *P. debilis*. Slender Pellitory. Forst. Prodr. n. 387.—Leaves alternate, stalked, ovate, quite entire, rather hairy. *Stalks* axillary, three-flowered. Stem nearly upright.—Native of New Zealand. Forster.

9. *P. cochinchinensis*. Cochinchina Pellitory. Loureir. Cochinch. 654.—Leaves ovate, three-nerved, hairy. Stem tufted, diffuse.—Native of China and Cochinchina, in neglected gardens. *Root* perennial. *Stem* herbaceous, a foot and half high, slender. *Leaves* opposite, entire, small, hairy. *Flowers* axillary, whorled, in little heads. Loureiro says that the natives use this plant to put at the mouths of vessels containing salt provisions, for that it attracts such vermin as would otherwise destroy the salted meat, or fish. It is also esteemed an emollient, refrigerant, and diuretic herb.

10. *P. arborea*. Tree Pellitory. L'Herit. in Journ. de Rozier. v. 33. 55. Ait. Hort. Kew. ed. 1. v. 3. 429. (*Urtica arborea*; Linn. Suppl. 417. L'Herit. Stirp. Nov. 39. t. 20.)—Leaves elliptical, pointed, slightly three-nerved. Stem arboreous.—Native of the Canary Islands, whence it was sent to Kew by M. F. Masson in 1779. It flowers from February to May. *Root* woody, branched, fibrous, reddish. *Stem* shrubby, five or six feet high, upright, round, branched, ash-coloured. *Branches* villous; red when young with hoary hairs. *Leaves* alternate, spreading, entire, veiny, bright green, soft and downy; rather paler beneath; the younger ones much wrinkled. *Flowers* in terminal panicles, composed of simple, axillary, erect, villous spikes. L'Heritier originally made this species an *Urtica*, but, upon further examination, referred it to the present genus.

PARIETARIA, in *Gardening*, contains a plant of the
P p 2 shrubby

shrubby kind for the greenhouse, of which the species cultivated is tree pellitory (*P. arborea*.)

Method of Culture.—This plant may be increased by planting cuttings of the young shoots in the summer season, watering them occasionally till they have stricken root. When the plants are well rooted, they may be removed with balls about their roots into separate pots, and have the constant protection of the greenhouse, in which they afford variety.

PARIETES is often used, in anatomical descriptions, to denote the sides or walls of a cavity; thus we speak of the parietes of the chest or abdomen, &c.

PARIGNE' L'EVEQUE, in *Geography*, a town of France, in the department of the Sarthe, and chief place of a canton, in the district of Le Mans; nine miles S.E. of Le Mans. The place contains 2636, and the canton 14,712 inhabitants, on a territory of 310 kilometres, in 12 communes.

PARILIUM, in *Botany*, Gærtn. v. 1. 234. t. 51. f. 1, appears to have received that appellation because the capsule consists of two equal parts, clapped close together, in an advanced state easily separable from each other. So the garments of the Romans made of a double stuff, were called *pariia*, from *par*, a pair. The genus thus denominated nevertheless retains the name of *Nyctanthes*, and its history is curious. The only species known is the *Arbor tristis*, which Linnæus forced into his original *Nyctanthes*, notwithstanding its capsular fruit; that genus, as at first constituted, having a berry, and differing from *Jasminum* only in having eight instead of five segments to its corolla. (See *JASMINUM* and *NYCTANTHES*.) He afterwards so entirely forgot the plant, having no specimen in his herbarium, that when he subsequently received one, he described it afresh in his Mantissa, by the name of *Scabrita triflora*, which was somehow changed in the Syst. Veg. to *S. scabra*. He was the more readily led into this error, by finding four stamens in the flowers; so that he placed *Scabrita* in his class *Tetrandria*. This character seems to be variable, for the plant is described with two stamens in the Hortus Malabaricus, which nobody has contradicted. But it has been found proper to remove all the berry-bearing species of *Nyctanthes* to *Jasminum*, there being no certainty in the number of segments in the corolla, which in the common *J. officinale* vary from four to six, and in others are five, six, seven, or eight. When the Linnæan herbarium arrived in England, *Scabrita*, which had always been a mystery, proved, on inspection, the identical *Arbor tristis*, for which the generic name of *Nyctanthes* is peculiarly appropriate. Even Jussieu, to whom Vahl had, rather surreptitiously as on many other occasions, communicated this intelligence, thought proper to let that name so remain, establishing a new genus, under the title of *Mogorium*, for the Jasmines with eight segments to the corolla; which however has not been adopted. (See *MOGORIUM*.) Vahl in his Enum. Plant. v. 1. 25, has acceded to the decision of Banks and Solander on this point.

PARILLA, in *Geography*, a town of South America, in the province of Panama; 70 miles N.W. of Panama.—Also, a town of Peru; 50 miles S. of Truxillo.

PARILOVA, a town of Russia, in the government of Irkutsk, on the Angara; 68 miles N. of Balaganfok.

PARIMA, called also *Paranapitima*, or the *White sea*, a lake of South America, in Spanish Guiana, is represented by La Cruz, as more than 100 British miles in length, by 50 in breadth. Its extent, and even its existence, have been doubted, as it was the noted feat of the city *El Dorado*, (which see,) the streets of which were paved with gold; a fable, which seems to have arisen from a rock of talc reflecting, like a mirror, the golden rays of the sun. N. lat.

3° 40'. W. long. 45° 20'.—Also, a large river, likewise called the Rio Blenco, which has its source in the above-mentioned lake, and which joins the river Negro, and great river Maranon.

PARIMA, *Mountains of*. See **ANDES**.

PARINA CAUCHA, or *Cocha*, or *Cocas*, a town of Peru, and capital of a jurisdiction in the bishopric of Guamanga, fertile in cattle, corn, and fruit, but receiving its principal riches from its silver and gold mines.

PARINARIUM, in *Botany*, Juss. 342, a name formed by that author from the *Parinari* of Aublet, v. 1. 514. See **PETROCARYA**; also **MAMPATA** and **NEOU**.

PARING and BURNING, in *Agriculture*, the process of paring off the surface of lands in the state of grass, in order to convert them into tillage, by means of fire. It is a practice for the most part employed on rough coarse grounds that are over-run with strong plants of the grass, moss, or heath kinds, and on some mossy or peaty lands.

The author of a late practical work states, that “the practice of bringing land into a suitable condition for the growth of grain or other crops by means of fire, by paring and burning the surface or sward, is probably a method of cultivation that was adopted at a very early period. It is a process by which various changes are produced in the materials of the soils on which it is employed; some of which would seem to lessen rather than improve their fertility, while others have obviously the power of promoting and augmenting it in a very considerable degree.” And that “the action of the fire during the time of the combustion, especially when carried to a great height, by forcing off and dispelling much of the moisture and elastic principles that they contain, as well as by reducing the proportions of vegetable and animal matters, which may be mixed and incorporated with them, must have the effect of producing some degree of deterioration; while, by its conversion of the fresh vegetable products, as the different kinds of coarse plants and grasses, into ashes of an alkaline, saline nature, which process has the property of quickly rendering the portions of vegetable materials which may remain, proper for supplying the nutrition of plants; and by combining oxygen with the argillaceous, earthy, or other particles contained in them, in such a manner as to be easily parted with during the incipient stages of vegetation, great advantage and improvement must unquestionably in many cases be produced. It would seem to be chiefly on the former principle, that the crops are generally found to be so abundant after land has undergone this process; as the saline substance contained in the ashes, though frequently small in quantity, by bringing such parts of the soils as were not before in a fit state for the purpose of being applied to the support of vegetables, suddenly into that situation in which they may be taken up by the absorbent roots of the plants, a vast immediate fertility may be given, but which must soon have the effect of exhausting the ground, if grass or some other kind of green crops be not cultivated in due rotation upon it. That some effect of this sort takes place in such cases, is shewn by the general experience of the most correct practical agricultors.” But besides this, there is also another way “in which the saline or other matters thus formed may be conducive to the purposes of vegetation, which is, by the great stimulus which it is known to afford to the roots of growing plants, by which they may be induced to take up a larger proportion of nutrient matters from the soils on which they grow. And on lands prepared in this manner, especially where they are of the clayey kinds, it is probable, that in some instances so much oxygen may be combined, by means of the fire, with the particles of clay, as, in particular situations and circumstances,

circumstances, to render it capable of forming nitrous acid ; as is the case with imperfectly-baked bricks, according to Dr. Darwin, which, where lime is made use of at the same time with the ashes, may constitute a sort of calcareous nitre ; a substance which experiment has shewn to be highly favourable to the process of vegetation."

Further, that "in the method of cultivating lands, by means of paring and burning the surface, such losses or deteriorations of soil as may be sustained, must evidently be produced by the quantity of vegetable or animal materials, which may have been consumed or dispersed in the state of carbonic acid or other aerial forms ; as it is sufficiently known, that not a particle of the real earthy matter of the land can be destroyed or carried away by the process ; it being left in most cases where the business has been properly performed, probably in a much more mellow and friable condition, than it was before the commencement of the operation, and perhaps more suited to the absorption of elastic principles from the surrounding atmosphere." It has, however, been stated by the earl of Dundonald, that "the disadvantage in respect to vegetable matter, is nineteen parts out of twenty ; but the above author suggests that, as he has not informed us what is the degree of loss of such matter by this process, where it is incorporated in the state of soil, or the nature of the experiment from which his conclusion was drawn, we are at liberty to believe, that in this mode of preparation it is not by any means so great, whatever it may be where the vegetable matters are themselves simply submitted to the action of the fire ; especially as in the trials which he has made by burning such soils as contained a large proportion of vegetable materials, so as nearly to resemble that of garden mould, consequently, having considerably more than is usually met with in the lands that are subjected to the operations of paring and burning, it has not been nearly in such a proportion even under a high degree of heat, which ought in every case to be as much as possible avoided." It is further conceived by the noble author, "that as it is only from the ashes of fresh or growing vegetables that saline matters, such as fixed alkaline salts, can be procured, none being produced from the burning of dead or decayed vegetable substances, the proportion of alkaline or other saline matters obtained by the process is so small, that if the utility or advantage of the practice depended materially upon them, it would be more economical to purchase them." "Experience has, however, shewn, the first writer observes, that whatever may be the proportion of saline matter which is formed in this way, a great deal depends upon the ashes which are produced ; as it has been found by those who have been largely engaged in the practice of this husbandry, that on those parts where the ashes were spread out upon the land as soon as the process was finished, the crops were highly luxuriant and productive ; while on those where they had been from necessity taken away, they were very mean and inferior, not being worth more than from an eighth to a tenth of the value of the others."

In respect to the nature of the saline substances that are formed during the process of paring and burning, they have been found to be fixed vegetable alkali, and vitriolated tartar : in the latter case, the alkali of the consumed vegetable matters uniting with the sulphuric or vitriolic acid, which is frequently found to exist in some state of combination or other in soils. These substances have been found, by the experiments of Dr. Home, to be capable of promoting the growth of vegetables in a considerable degree.

And in addition to these modes, in which the practice of paring and burning may be beneficially employed in the cultivation of land, there are some others which seem of a more

mechanical nature ; such as its reducing the various kinds of coarse vegetable productions, as heath, furze, different sorts of dwarf shrubby plants, tough bent grasses, rushes, and many other aquatics, into such a powdery carbonaceous slate, as that, by the ready action of other substances upon them when thus reduced in the soils, they may become useful in promoting the growth of proper kinds of vegetables ; but which, without undergoing this process, could not, by any means, from their great elasticity, and almost indestructible properties, be prevented, for a very considerable length of time at least, from rendering the ground too light and porous for growing any sort of grain crops. And the state and condition of the soils, in so far as respects their textures, as already suggested, must likewise, in many cases, be greatly improved, being, by such means, when properly performed, rendered much more mellow and powdery, and thereby more proper for the admission of the fibrous roots of the growing plants, as well as more capable of minutely dividing the particles of the manures, of whatever kind they may be, that are afterwards applied to them, and consequently of affording a more full and equable supply of nourishment to the crops that may be cultivated. And from the process radically destroying, in most instances, when well performed, all sorts of plants of the weed kind that may have established themselves in the soils which are subjected to the operation, the lands are left perfectly clean, and therefore in the most proper situation for affording the whole of the nutritious properties which they contain to the support of the crops that may be grown upon them.

From this view of the manner in which this process may contribute to the improvement of land, the nature of the products that are formed by it, and the effects which they produce on the soils, it would appear to be a mode of cultivation more adapted to some sorts of land than others ; as where they are light or thin, and there is much vegetable matter accumulated within the soil, whether from the decay of successive crops or different sorts of plants, for a great length of time, or the repeated applications of manures, without their having much sward or coarse vegetable products, such as have been mentioned, growing upon the surface, it may do harm, especially when a great degree of heat is not carefully guarded against, and judicious modes of cropping introduced, by lessening the quantity of useful vegetable matter which they contain, without supplying any thing as a compensation. But where they are more stiff and heavy, and there is a thick matted sward, disposed to the production of moss, or covered with any sort of rough sward plants, whether of the grass or other kinds ; it must, when cautiously practised, be a highly beneficial, and perhaps, in many cases, an indispensable mode of cultivation ; not only by rendering them more open and porous in their textures, and reducing the coarse vegetable mass into that sort of form in which it can be readily turned down and incorporated with the earthy materials, but also by supplying a portion of saline or other matter, that may operate still further in promoting their fertility and productiveness. These are considered as the effects of the process, and the cases in which it should be made use of, or rejected, as is fully shewn by the experience of the most exact and careful practical farmers. Mr. Donaldson, an intelligent inquirer, who seems to have paid great attention to the effects of the different modes of practice that are employed in different districts in the cultivation of land, it is remarked, he observes, that such soils as are light and friable, are every where considered as unfit or improper for being treated by means of this process. And an experienced writer, who appears to have cautiously examined the nature and effects of the operation, assures us,

PARING.

he says, that he has many doubts about the propriety of extending the practice to such soils as have been already fertilized and brought into a proper state of tilth, by the application of manures.

It is suggested, that there is also another sort of soil on which the process of paring and burning must be practised with equal caution, or perhaps in some cases be wholly rejected, from the danger there is of its reducing the materials of which it is constituted in too great a degree. This is that of the peat or mossy kind. In this case, the author mentioned above supposes, it is not the plants which grow upon it, but the very substance itself, that served as a soil on which the plants grew, that is totally destroyed by incineration. This substance is, by burn-baking, amazingly diminished in quantity; and the little that remains, instead of soil, after this destructive process, is an inert earth, which is more unfit for the purposes of vegetation than any other that has ever fallen under his observation. There cannot, however, be any doubt but that, in some cases, mossy soils may be subjected to the process of paring and burning with much benefit to the cultivator, provided that it be performed with proper care and attention. And it is unquestionably practised in various districts without any injury being produced by the destruction of the materials that constitute such soils.

In cases where the soils are of the four, heavy, stiff, and fenny kinds, and where overgrown with such coarse vegetable productions as have been already mentioned, there cannot be the least doubt of the propriety of adopting such a method of practice in breaking them up and bringing them into a state of cultivation.

Mr. Young has well observed in his Calendar of Farming, in regard to the contradictory opinions held on this practice, that by one set it is pronounced, contrary to every principle, that it is a wasteful, extravagant operation, which dissipates what should be retained; annihilates oils and mucilage; calcines salts, and reduces fertile organic matter into ashes of very weak efficacy; that the vegetable particles which are brought into play at once, for the production of a single crop, by less desperate management might be husbanded to the support of many. On the contrary, the advocates for this management assert, that these objections are all founded on vain reasoning, and philosophical theory; that practice the most decided, and experience the most extended, pronounce it to be an admirable system; and that the mischiefs often quoted as flowing from it, are to be attributed merely to the abuse of the method, and by no means necessarily connected with it. And he must, without the least hesitation, declare, that the latter of these opinions is that to which he must subscribe. To trust to reasoning in matters of agriculture, is a most dangerous reliance. He shall leave others to detail their philosophical speculations, and rest what he has to offer solely on the practice, various and extensive, of numerous agriculturalists, and on the common husbandry of many spacious districts. These agree in declaring, and it is most particularly to be had in remembrance, for the enemies of the practice admit it, that by paring and burning you may command two or three good corn crops in succession. The fact cannot be denied; for whether you examine the peat of the Cambridge fens, or the shallow chalk soils of the downs and wolds of Hampshire, Gloucester, and the East Riding, it is known, that bad farmers do act thus absurdly. They get great crops, but they too often take them in succession, to the injury of the soil, though not to its ruin, unless that can be esteemed the ruin of land, which enables the tenant to pay a double rent for it. Such farmers have been in the habit of burning for wheat, and then taking two crops of spring corn; all good. Now, it might be asked, how is it

possible that that husbandry can have all the philosophical evils detailed above, of annihilation, dispersion, conversion, and destruction, which enables a soil, naturally poor and weak, to give two or three good crops of corn? Their argument evidently proves too much. The effect shews that there is a powerful cause or agent in burning, which they do not understand; which escapes from the retort of the chemist, and from the *rationale* of the theorist. That operation or manure which will give a good crop of wheat, will give a good crop of turnips or cabbages; and he, who having made this commencement for the food of sheep on the land, and knows not how to go on preserving the advantage he has gained, is a tyro in the art of husbandry. The farmers that are railed at, know it as well as their philosophical instructors; but avarice, united with the baneful effect of short, or no leases, make them practise against their judgments. It is maintained, that paring and burning will, on all soils, give turnips or cabbage; these fed on the land by sheep, will secure barley or oats, and seeds; the seeds fed with sheep, whether for a short or a longer duration, will secure another crop of corn adapted to the soil; and in this stage of the progress the soil will have gained much more than it has lost. To instance cases which he has seen, and to quote authorities for these assertions, would be tiresome. He could produce instances from more than half the counties of the kingdom in support of it.

But further, it has been often contended that burning lessens the soil. If this happens any where it must be in peat; yet in the fens in Cambridge, this husbandry has been repeated once in eight years for a century and a half, and the proofs of a loss of depth are extremely vague, in every instance he has met with, and hardly to be distinguished from that undoubted subsidence which takes place in drained bogs of every description. In all other soils the assertion may be safely and positively denied. He has calcined pared turf, not calcareous, after careful separation and weighing, and in a heat far exceeding what is ever given in densifying heaps, and on re-weighing, found the loss too minute to be attributed to any thing but loss of water intimately combined, but driven off by heat, and re-exposing the earth to the atmosphere, free from rain, found an increase rather than a diminution of weight. The vegetable particles only are reduced to ashes. These, in any method of putrefaction, would dissolve, and combining with water, be exhaled by heat, or absorbed by the vessels of plants. In ashes, these are in a more fixed state, relatively to the influence of the atmosphere. That plants feed on them, the great crops that succeed offer abundant proof. In conclusion, it is noticed that there are men who are timid in acknowledging truth, who admit the practice to be good, in poor soils, and in peat, and sedgey bottoms, but fear it on better land. Experiment is against them, for in Yorkshire, land of 20s. and 30s. an acre, has been thus broken up with great success; but in what manner do they reason? Rich soils are full of vegetable fibres. Then there will be the more ashes. These are in proportion to the organic matter. Peat, which these men admit to be burnt, is the richest soil in the world, and therefore burning the most universally practised on it. The soil itself is not reduced; if it was rich before burning, assuredly it will be rich after it. And in addition to these circumstances, is the capital one, of destroying insects, grubs, and weeds. These are apt to abound most in the richer soils, no reason for abstaining from this husbandry on such. He ventures therefore to conclude, that paring and burning, with a proper course of crops, is safe on any soil; and essentially necessary on some. He however well remarks, that very rich ones will do exceedingly well in many cases without it. This distinction,

PARING.

distinction, therefore, should be made. There is, in some cases, no necessity for it; there is in others.

It is observed in the twelfth volume of the Annals of Agriculture, that on inclosing the waste lands in the parish of Bows, in Yorkshire, large portions of the ground were subjected to the process of paring and burning; and the few persons who ploughed up the ground without previously employing this method, had reason to regret it. And it has been stated by a writer, in speaking of bringing into cultivation the chase lands in the county of Middlesex, that the impropriety of breaking up this kind of land, without paring and burning, is manifested in the neighbourhood of Beech-hill, where land, after twenty years inclosure and cultivation, is in a worse state than it was originally. Well would it be for the owners of such allotments, if they could now pare and burn it; but it has been ploughed, and not reducing more than what the vermin destroyed, laid down in so rough a state to grass, as to be incapable of being pared and burnt; the original wiry bent and dwarf shrubs are now growing in full vigour; and that on the inclosure of Stanwell, in the same county, the allotments on Hounslow-heath succeeded well under the perfect practice of paring and burning, and ill, where the turf was ploughed without the application of fire. In the former case the land was immediately fit for turnips, tares, barley, and clover: in the latter, the tough, wiry bent, heath, and dwarf furze, kept the land too light and spongy for any crop. Even rolling, he asserts, cannot keep it down, for its elasticity raises the soil soon after the roller has passed over it, and it is of to imperishable a nature, that it is likely to plague the farmer for many years. The difference between the two methods of breaking up rough ground, is more than the value of the freehold in favour of paring and burning, whereas the other proceeding leads to nothing but expence and disappointment. It is likewise added that paring and burning has more merit than any other manure, in its property of converting heath, furze, shrubs, and wiry bent, into coal, most fitly prepared for the food of plants; and that it will pulverize such a soil as much in two years as all other means can effect in twenty. And others contend, that on any sort of soil which has not before been reclaimed from a state of waste, and where furze, broom, brambles, ferns, rushes, &c. abound, these operations, when properly performed, are productive of the most beneficial consequences. That there is perhaps no other method that could be devised, so well adapted for preparing land in a state of nature, and incumbered with such productions, for valuable crops with expedition and certainty; and that, on this account, paring and burning might well be considered by Virgil, and other ancient writers, as a sure means of improvement. And that, in such cases, they are so at this period, may, it is thought, be proved by the concurring testimony of those to whose lot it falls to cultivate the common or waste lands in many of the new inclosed districts of the kingdom. It is further stated, that instances are frequently met with of great advantage, resulting from this mode of management; and that wherever land is rendered unfit for cultivation by the incumbrances that have been mentioned, the Devonshire mattock and the paring-spade may be used with the greatest propriety, and the best effects.

In the Agricultural Survey of Suffolk, it is stated, that in that district they could not cultivate without this capital assistant. It is scarcely possible, profitably, to bring boggy, moory, and peat soils, from a state of nature into cultivation, without the assistance of fire, which is the most effective destruction of the spontaneous growth, and never fails,

unless the men employed do not pare deep. However, of late years an opinion against it has prevailed much in some counties. Several of the nobility and gentry of very large estates have interdicted the practice, not allowing their tenants to pare and burn under any pretence whatever. The reason assigned for this conduct is an apprehension, that the depth of the soil decreases from it, that you burn *the land*, and reduce half an inch to half a line, a great evil when the land is perhaps only three or four inches deep on a lime-stone rock. But this reasoning, many very sensible and experienced farmers know to be false. They, on the contrary, urge the universal circumstance of no land ever being pared till it has acquired a turf, which with natural grasses will be from seven to twenty years, and with sainfoin the duration of the crop, which is from ten to twenty years; that it is not the *soil* which is burnt, but the bulbs of the plants, the roots and net-work of grass roots; the earth which is intermixed is not burnt, it is calcined but not reduced to ashes, all of which arise from bulbs and roots: hence the fact that the staple of the soil rarely suffers from paring and burning. If this reasoning be not true, whence the known fact that soils not four inches thick, and which have remained at the same thickness as long as the oldest man can remember, have yet been pared and burnt regularly four or five times in a century? and as the same husbandry is known by record to have been practised for ages in the same land, the staple must have left three inches every hundred years; in other words, it must have been totally gone long ago, and nothing but rock remained; all which is evidently false, the soil at this day being as thick as ever. We may hence conclude, what such farmers assert to be true, that the earth suffers no diminution, those roots and bulbs only being reduced to ashes, which in breaking up by the plough alone would rot away.

In speaking of the objections which have been made to this practice in fen districts, from the idea that it has the tendency of reducing the soil greatly, as is shewn by the sinking of drained lands that have been pared, the same writer adds, that it has been found that a series of ploughing and cropping stiffens, concentrates, and diminishes the lighter kinds of fen soils; and that the stratum of black peat earth, which on their first breaking up was considerably deeper than the plough ran, has been within the memory of the present occupiers, without any fresh paring or burning, so far reduced, that without taking more mould, or ploughing deeper than they formerly had been accustomed to do, they have not only passed the whole of the black peat stratum, but have ploughed up two or three inches of the clay beneath it; and that if it be granted, which will scarcely be denied, that the surface of the adjacent depastured fen lands, from the decay of vegetables, dung of animals, and the soil brought thither by the waters from the neighbouring high lands, has been continually, though slowly, increasing, there will then appear other reasons for their present different level than mere paring and burning. It is well known, that earth is not to be dissipated by combustion; it is more likely this appearance proceeds, in the first place, from the light peaty earth of a fen soil being gradually consolidated by alternate cultivation and pasturage, so as to sink below the level it formerly preserved in its uncultivated state; and in the next place, may it not proceed from the commons gradually rising higher by the accumulation of mud and soil deposited by the upland waters? All these facts, which obviously rest upon the foundation of practical experience, sufficiently demonstrate that little danger is to be apprehended from the destruction of the soil, when the process is properly performed, and a correct method of management pursued with the land.

PARING.

The effects of the process may, however, be examined a little further, as they stand in respect to the different sorts of soil.

Clayey Soils.—Mr. Young supposes that many appropriate reasons have not been brought against the practice on this sort of land; the only one that merits the least attention, is the assertion, that it converts what is properly soil, into pieces of infertile brick. The fact is not so, for every one that ever burnt clay for manure, knows that though there are many lumps of the substance which they allude to, yet, that the mass of the heaps consists of ashes, properly so called; but when the tenacity of this soil, which is one of its greatest evils, is considered, it will be found that bricks are an excellent addition to the soil, to loosen and open its stubborn adhesion. He has seen and examined carefully heaps of clay ashes, amounting to many hundreds of loads, that have been burnt and applied to great profit on this soil. By paring and burning you have, therefore, on it the common manure found in vegetable ashes, and you have in addition a substance which acts mechanically. Hitt, he says, who wrote from practice, and whose writings abound with many just observations, remarks: I recommend burning of the surface as the cheapest manure, and most effectual of any; for it not only adds salts to the soil, which the burning of grass-roots produces, but it opens part of the stratum of clay next the soil so much, that the roots of vegetables can afterwards feed therein; for when the turf of a piece of land has been burnt in heaps, at four or five yards apart, though all the ashes be taken away with some of the clay, and spread over the other parts of the land, yet neither corn nor turnips will grow so vigorously there, as on those places that were only opened by heat.

Also near Guilford, Mr. Birbeck has found this practice highly useful on clayey soils. After remarking that by the process, that portion of the turf, which contains from three-fourths to four-fifths of the undecayed fibres, is at once converted into a substance the most favourable to vegetation; he has had the most decisive proofs of the preference of paring and burning, to fallowing and to sowing on the fresh turf on both clays and loams, and that he has never had occasion to notice the impoverishment from the former, which he had suspected; on the contrary, the reverse has been so obvious, as to amount, in his judgment, to very strong evidence, if not demonstration. And he believes, that if the crops on equal quantities of land subjected to these different processes, were accurately weighed for two, or perhaps three years, it would be found that the produce of the pared and burnt land would exceed that of the fallowed, by more than the amount of the whole turf consumed.

Near Beverley in Yorkshire, Mr. Moss likewise gives an instance, within his own knowledge, of a farmer breaking up several closes of old sward, one of the best of which, about twelve acres, he ploughed out, and pared and burnt the rest. The first year he lost 100*l.*, the second 100*l.*, and the third 50*l.* for want of paring and burning; the whole loss 250*l.*, being more than 20*l.* per acre, at that time about two-thirds the value of the land. This was a fine sweet sward, and has not been superior since to the pared and burnt land, on account of cropping about twenty years.

And on poor clay near Horncastle, Mr. Elmhurst, after properly draining such as wanted it, pares an inch, or an inch and a half thick, about Lady-day, and gets it well burnt. So soon as all or a good part of the piece is burnt, he spreads all the ant-hills as level as possible upon the ground betwixt the ash-hills. He then has the ashes all evenly spread, and as soon as a tolerable rain comes, he has the

whole well harrowed, and ploughed shallow-furrow for turnips; and for the most part has had very good crops; which he always eats off with sheep. As the land is not broken up too deep, as soon as the turnips are eaten off, and the land is dry enough, he has it ploughed up again into small lands, about two inches and a half, not more than three deep; and with two more ploughings and harrowings in good time for sowing it with cole-seed, and then barley. He has often had more than six quarters per acre, and the next year from five to six quarters per acre of wheat, upon poor land by this process; and in various parts of the country, where he has for many years occupied such lands, paring and burning such sort of land is the very best practice that can be used, as it tends to the enriching of it, by the greatest quantity of manure that can be obtained.

Also on poor cold clay, the same thing has been experienced by Mr. Maxey, in Bedfordshire. Thirty years back he broke up a piece of sward of this description, one part of which he pared and burnt, another he ploughed with horses, and a common plough, ground sharp, as thin as it could be, which part he also burnt; the remaining part was fallowed the succeeding winter. The part that he had ploughed by horses, which was about five acres, abounding with ant-hills which consisted entirely of clay, he was under the necessity of burning in large heaps, whereby a large portion of the essence was destroyed. On this he had more ashes than could be used to advantage thereon, and from which, after spreading a double portion, he manured eight acres in an adjacent field. Now, were burning so prejudicial as has been represented, this piece must have been utterly ruined. The two pieces thus burnt were prepared for wheat, and in due season sown therewith; the other with oats, which was a very poor crop, owing in some measure to the grub and other insects, to which this kind of land is subject; and which in a great measure are destroyed by the preceding process; the wheat on both pieces was very fine, but that which was ploughed by hand was somewhat better, which he ascribed to the superior quality of the ashes, they being the product of the surface only, and burnt in small heaps. In the course of cropping that followed, the parts burnt were so much superior to the other, that he shall not exaggerate if he says, he had more profit from an acre of that burnt in three years, than in five from the other part. It is worthy of remark, that those spots where the large heaps were burnt, on which the whole surface or staple quite to the clay was consumed to ashes, yet by their situation not to that degree as was the bulk of the heaps, the fire not being so strong next to the ground, but so as to retain its essence, not only produced the most luxuriant crops at first, inasmuch that he has been under the necessity of mowing them down twice, and yet has had so much at harvest; but continued for a number of years superior to any part of the field. When he has manured this field, he has avoided laying any dung thereon, and yet it is at this time, after a lapse of thirty years, equal to any part of the land. This confirmed him many years back in the propriety of burning, as it is a demonstrative proof of its efficacy and advantage, and a full refutation of all the objections which he has heard advanced to that practice. The advantage in burning in many instances is much greater than he has described, as much depends upon the season. If it should prove a fine dry time, the turf may be burnt much more quickly, and in smaller heaps, whereby the quality is rendered far superior than it can be, in wet unfavourable seasons, when it cannot be burnt in such small quantities. He particularly recommends it to be burnt in as small quantities as the season will admit; if only scorched the

PARING.

the better. For the above reasons, he recommends paring by hand in preference to that by the plough. In further proof of the advantage of burning, he states a recent experiment of two neighbours in an adjacent parish where an inclosure took place five years back, at which time they had each a portion of waste or common laid to their allotments adjoining to each other of equal quality: the one who is the proprietor pared and burnt, and sowed in succession with cole-seed, barley wheat, wheat, barley: all of which were good crops. The land is at this time under winter tares, which he proposes feeding off with sheep, and sowing it with wheat again in the autumn. Although he cannot recommend such a course of cropping, yet he doubts not, as the prices of the produce have been, but that he will profit very much thereby; and that its own produce of dung will more than compensate the expence. The other farmer, who is a renter, (probably like the majority of renters, under some injudicious restraints laid down by some farmer's land *taster*), fallowed his land in the winter, sowed barley, oats, cole-seed, and barley, all of which were very poor crops. The former calculates that he has made a profit from fifteen to twenty pounds an acre more than the latter, and that his land is in a far superior state for any succeeding crop. It is objected that land which is burnt will not bear clover, the fallacy of which he has proved in many instances, having always found the clover on such land to be equal to that on land which is not burnt; but this he has also discovered, that no land of this description whilft new, either burnt or not, will bear clover to advantage; it must first go through a course of cropping of at least five or six years, when it will be of a better texture for that purpose.

Loamy Soils.—These are, Mr. Young says, especially when good, those upon which the practice has been most condemned; but here we have some experiments to recur to, which, in his estimation, set the matter in so clear a light, that nothing more is necessary than to recite them very shortly. Mr. Wilkes, of Measham, in Derbyshire, has for many years been in the practice of ploughing old rough pastures, the soil a stiffish loam, eight or nine inches deep, and burning the old furrow in heaps of thirty or forty bushels each, the fires lighted by a few coals, and coal-slack; the effect was very great, and the improvement immense and durable. Mr. Wilkes is of opinion, from the experience of many years, that even this burning, which is twenty times the depth of common paring, does not waste the soil in the least, but does no more than break the texture of stiff soils, expelling a great quantity of water; that by exposition to the atmosphere the land re-absorbs its water, and by the great immediate fertility, fills itself presently with more vegetable particles than it had before. Thirty years ago his father burnt at Oversea, exactly in the manner described, a field of ten acres, which was not then, and has not since been treated with any more favour than the fields adjoining, yet it has ever since retained a superiority. And the writer, in 1790, hollow-drained an old grass-field of four acres and a half, of cold, wet, poor loam, on a clay-marle bottom; the rent 9s. an acre, and not worth more in its then state, perhaps, than 7s. In 1791 he ploughed four acres of it four inches deep, which was the whole depth of the soil or surface, of different colour from the stratum beneath, between that surface and the clay-marle, and burnt the whole furrow of the part so ploughed. Having no coal-slack, and wood being dear, he made but four heaps in the field; the consequence was, the heat and degree of calcination were far beyond what is ever practised in common, and many persons who knew and approved of paring and burning in the common way, pronounced the field completely ruined. The ashes

were spread, and ploughed in with a shallow furrow, and turnip-seed sown, and very slightly bush-harrowed. The crop was very fine, worth, to sell for feeding on the land, at least 50s. an acre. The crop on the burnt part double to that of the half acre.

And after feeding them with sheep, the land was ploughed thrice, and sown with oats and grasses. The oats produced above seven quarters an acre, and the grass has ever since been much better worth 20s. an acre than it was worth 5s. before. The oats on the half acre were not threshed separately, but judged by those that viewed them to be much inferior to the rest. About half the field has been since dressed with earth and road fuggage, and once dunged slightly. It is remarkable, that in three years crested dog's tail, an excellent grass, common in the country, the feed heavy, and which, therefore, could not be carried by the wind, began to appear, and has been increasing ever since. There is at present no perceptible difference between the part burnt and the other not burnt; if any thing, the burnt is best. These two experiments prove, if any thing can, that paring and burning does not lessen the soil, in its most excessive application, and that it works a very great improvement on loams.

Likewise on stone-brash and light loams, near Bristol, the Rev. Mr. Swayne has experienced the advantage of this process; he, indeed, has remarked, in more instances than one, the beneficial effects of combustion, in promoting the growth of vegetables on red or yellow ferruginous clay or till, which have long been ranked among the most unfruitful of soils. It is that the mineral oil, with which these soils abound, and which in its natural state may be the cause of infertility, is by the action of the fire wholly dissipated, in the case of the clay being burnt red, and converted into carbonaceous matters, when that is burnt to a black cinder:—or, is this effect, he asks, produced chiefly from the mere admission of water owing to the alteration made by fire in the contexture of the clay? However he may be unable chemically to account for it, he is well assured of the fact.

But the following detail of a field pared and burnt, may possibly be thought of more consequence to the present inquiry, than the before-mentioned small and unfinished experiment. A small close of old grass lay of between two and three acres, the soil a lightish hazel loam, of about eight inches staple, upon a clay subsoil, underneath which, at the depth of two or three feet, several strata of stones, which will burn to brown lime, was let, in the year 1796, to a common labourer, for the term of five years, at the rate of five guineas *per acre per annum*, to be ploughed up for potatoes, or any other crop he might choose to raise. In the month of February the turf was pared with a breast-plough, and burnt in the month of March, the ashes then spread, and the ground immediately ploughed. In the months of April and May it was planted with potatoes. The summer being rainy, it was found that the potatoes had been planted too thick. The strength of the fresh ground manured with the burnt sward, caused them to run too much to haulm. However, fifty-six sacks of potatoes were dug from fifty perches of ground. The second year it was again planted, the greater part with potatoes, some part with wheat. The produce was not ascertained. After the potatoes were dug up, part of the ground, exactly half an acre, was sown with wheat in the beginning of December. The wheat was hoed in; that is, drills were opened with the potatoe-hoes, at about nine inches apart. When one drill was opened, the seeds were scattered therein as evenly as possible by hand, after the rate of about one bushel to an acre. In making a second drill, the earth hoed thereout covered the wheat sown in the first, and so on. The crop of wheat, owing to

the uncommonly wet season, run much to straw, but its produce was sixteen bushels, or after the rate of thirty-two bushels an acre; a very rare crop in that unpropitious season. The rest of the field was planted with potatoes: no account taken of their produce. The fourth season, two roods and a half were sown with wheat, the sort red lammas, in the same manner as in the former year: the produce nineteen bushels. A better crop, by fifteen bushels an acre, than any farmer's in the neighbourhood. The straw was purchased by the writer at two guineas and a half.

Sandy Soils.—In regard to sandy soils, it is remarked by Mr. Young, that Hitt, a practitioner of this husbandry, observes, that it improves sandy soils as much as any other; and he has seen some fields thus worked in Suffolk and in Cambridgeshire, and improved by it, though under a course of crops by no means admissible. There is not the least reason, from analogy, to doubt the effect on this, or indeed on any soil.

And in Suffolk, Mr. Baldock found vast advantage from the use of this mode of breaking up poor sandy soils on an extensive scale. In the course of twelve years, the land broken up in this manner has cost near 60*l.* *per* acre, but the produce which has been afforded has been fairly estimated at 120*l.* *per* acre in the same time.

Also, on this skinned warren land, near Spillsby, Lincolnshire, Mr. Kershaw has found this practice beneficial. In the year 1782, he entered upon a farm of nearly seven hundred acres of land, which had chiefly been in a warren, and was at that time of very small annual value. A considerable portion of this land was pared and burnt, and found to answer his most sanguine expectation. The crops were full as much more as from the land which was broken up and sown in the common course of husbandry. In order to prove this assertion, he mentions two or three circumstances of the process and conduct. At Michaelmas 1782, he entered on the largest part of the farm; he had, amongst other lands, a walk containing forty-five acres, valued to him by the quitting tenant, from that time till May-day 1783, at forty shillings. He mentions this to shew the poverty of the land, which was so thin skinned, that to have pared and burnt it was not practicable; he therefore, the year following, ploughed it up and sowed it with oats, the crop of which was scarcely worth the labour. The summer after, working it well, and getting it into good condition, he sowed it with cole, and it produced but a scanty crop. The spring following he laid thirty acres of it down with sainfoin, of which he had good crops for several years. When it was worn out, having a good deal of rough grass upon it, he pared and burnt it, and got a good crop of turnips, considering that it was a very dry season; after which, he sowed it with oats, and had a remarkably good crop for that kind of land, more than six quarters *per* acre. The year following he sowed it with turnips and cole, which were decent crops; ear them off at Michaelmas, and sowed the land with wheat. The middle of February he laid about three quarters of foot *per* acre, and the latter end of April laid it down with a stone of white clover, and two bushels of ryegrass *per* acre, and harrowed the seeds in upon the wheat; the latter yielded near a chaldron *per* acre, and a finer crop of seeds could not be seen. He has continued them ever since, and the land has kept three times the stock it was ever known to do before. This clearly shews the utility of paring and burning; in proof of which the thirty acres so cultivated, part of the forty-five valued at forty shillings, are now worth from six to eight shillings *per* acre, for the same period of time.

The other fifteen acres of the best land he worked in the

common way, without being able to get any turnips; the crops of corn were scanty, and the seeds did not afford more than a proportion of two-thirds for the feed of sheep. In the year 1791, he pared and burnt another piece of sainfoin, about eighteen acres; also a piece of grass seeds twenty-five acres, on both of which he had remarkably fine crops of turnips.

Likewise on poor, gravelly heath land, Mr. Wright, in Rutlandshire, has found this practice to answer perfectly. In March 1799, he began grubbing, paring, and burning a twenty-four acre piece of this heathy land: in June, sowed it with turnips, on one ploughing, not suffering the plough to exceed the depth of two inches, lest the ashes should be buried, and out of reach of the turnip to taste. As harrowing this tough sod would have made it lie worse instead of better, the seed was sown, and only bush-harrowed. The plants came up true and well; but, after hoeing, the places where the fires had been, grew, if possible, ten times as fast as those where there had been none, notwithstanding there were no ashes left on those spots. This shews the amazing fertility of fire, and is a lesson to him and all future burners, to make their heaps as small as possible, so as to enable the fires to cover as much of the surface as may be; for, if all the ashes be swept off, and even some of the surface pared off, it will still be superior to the ashes, as he fully experienced. Another advantage arises from making the heaps small, which is the quality of the ashes; the larger the heaps, the more intense the fire, and the centres of such heaps get too much burned, as may be seen by the redness of the ashes; those on the outside being perfectly black, and very little inferior to foot. This ground produced a most excellent quality of turnips (as indeed all burnt ground does), 2*l.* 10*s.* *per* acre. He afterwards sowed with barley on one ploughing, in March: a finer crop he never saw (quality of land considered); it was estimated at five quarters *per* acre, throughout the piece, but not yet threshed; clearing to him as much in one year (and consequently a proportionate benefit must accrue to the nation), as it would have done by pastureage, in its original state, in a century.

Chalky Soils.—Mr. Young observes, that in respect to these, we have a much more ample field of experience, for it has been, and is the common method of breaking up downs in every part of England. On the Cotswold hills, in Gloucestershire, it is the common husbandry, and often repeated. The sheep walks and warrens on the wolds of the east riding of York, and of Lincoln, have thus been brought most profitably into culture, though not with the attention in cropping that ought to have been given. In Hampshire and Wilts, the same husbandry prevails. In these counties he has been shewn lands that have been pronounced ruined by this husbandry. The cropping was bad, but still the rent had been doubled by the practice. It is stated in his Eastern Tour, that, in the west riding, colonel St. Ledger remarks, that if burning walled the soil, his lime-stone lands, only four inches deep, would have been gone long ago, as it had been pared and burnt for ages.

In Kent, he lets Mr. Boys speak for himself: who observes, that if any persons who condemn paring and burning should come into Kent this summer (1795), he can shew them several scores of acres of wheat, barley, oats, and sainfoin, now growing on land which has several times undergone that operation. The crops of sufficient value to buy the land at more than forty years' purchase, at a fairly estimated rent before the improvement. It is humbly presumed, that Messrs. Kent, Claridge, and Pearce, the great enemies of paring and burning, will not pronounce this land ruined by that execrable practice.

And

PARING.

And in the experience of Mr. Birbeck, near Guildford, in Surrey, on a chalky soil, two fields, making together about fifty acres, were laid down in an exhausted state. When they had acquired a turf, one received a summer's and winter's fallow, the other was pared and burnt; and both were sown with barley and seeds. The effect was strikingly in favour of the latter, both in the barley and seeds which followed.

And another field of the same quality, twenty-two acres, was pared by the plough in the spring of 1799; and about half of it was harrowed repeatedly during the summer: the wetness of the season prevented the burning; but as the turf was completely killed, and much broken by the harrow, this part of the field became a good fallow. The remainder, not being disturbed, set again; and, the following spring was nearly as green as before. In the succeeding summer, the operation of burning was thoroughly performed: where it had not been previously broken by the harrow, the entire turf, down to the chalk, was subjected to the fire; and in the other, though nearly decomposed by two years' fallowing, enough was burnt to produce a tolerable sprinkling of ashes, to stimulate vegetation, if that were their property. This field affords a fair opportunity of deciding betwixt the two modes of reducing old turf to tillage. He expected that, in this instance, the fallow would have taken the lead by the help of the ashes; but in the turnips now growing, the seeds are very much in favour of the pared and burnt land.

Peaty Soils.—Mr. Young states, that whatever variety of sentiments there are on this method, for other soils, here there can be none. The universal practice, from the flat fens of Cambridge to the swelling bogs of Ireland, the mountainous moors of the north of England, the rough fedy bottoms, in almost every part of the kingdom, when they are broken up by men of real practice and observation, are always done by paring and burning. Registered experiments of doing it by fallowing, are to be met with in various works. The Board's reports of the North Riding of York, and of Somerset, detail some; others are to be found in his Tours; and the result is either loss, or a profit so very inferior, that the question ought to be considered as settled and done with. Let it sleep for ever, except for the wrong-headed individuals who will, upon every question, arise in every age to contradict the common sense of mankind.

Paring.—In the method of performing the process there are some slight differences in the practice of different districts; and perhaps in managing this business, an attention to the nature of the lands may be as necessary as in other cases of husbandry: as it would seem that some, as those of the more clayey and heavy kinds, would be most benefited, by having the fire to come as much as possible into contact with the whole of the superficial parts of them, without being carried too far; as by that means they may be rendered more proper for the reception of the roots of vegetables, after being slightly ploughed, as well as more suitable for supplying nourishment to them; while in others, as those of the more light and thin descriptions, it might be most advantageous to merely consume the thin paring of sward after being piled up for the purpose; without permitting the fire to exert its influence upon the mould or soil immediately below, as in this way there would not probably be so much danger of injuring the staple by destroying the vegetable matters contained in such soils. Of course, that in the first of these modes of burning the sward, the sods or parings should be piled up as little as possible into heaps, the advantage of a suitable season being taken to apply the fire to them in the state in which they lie, or

are set at first after being cut up, or after a few only have been placed together, as happens in some instances, where they are, immediately after being cut, set on edge to dry, and placed in serpentine directions, in order to prevent them from falling over; but in the latter cases they should be formed or built up into little circular heaps or piles, somewhat in the form and size of the little cocks made in hay-fields, the sods being placed the grass-side downwards, in order to admit air; but the openings both at the bottoms and tops, after they have been fully set on fire by some combustible substance, such as straw, &c. are to be closed up, as well as those in other parts covered by an addition of sods; so as that the combustion may proceed in a slow, smothering manner, such as is practised in the making of charcoal. When the whole of the earth in each of the piles has been acted upon by the fire, the heaps may be suffered to extinguish themselves by slowly burning out.

And there is another method of practice of this kind, which is much in use in some districts, as in Devonshire and Cornwall, for breaking up and preparing grass lands for the reception of what have been termed fallow crops, which is that of skirting; in performing which, a part of the sward or surface is alternately left unturned, upon which the next thin furrow-slice is constantly turned, so that the swards of each come in contact, by which means the putrefactive fermentation is speedily excited, and the greatest part of the grassy vegetable matter converted into manure; what ultimately remains undestroyed being, after repeated cross-cuttings with the plough, and harrowings, all the mould or earthy matter having been previously well removed from the roots of the plants by shaking, collected into small heaps, (which is done either by the hand, or with iron-headed rakes, constructed for the purpose,) and burnt, the ashes being then spread evenly over the land. The operation, when managed in this way, is termed beat-burning, and would appear to be the most proper and useful on land, where the turf or sward is not very tough or matted together, and where there is little or no coarse vegetable products growing upon the surface of it.

In separating the sward from the surface of the soil, different implements are made use of in different parts of the island: that which was the most employed in the infancy of the art, was a kind of curved mattock or adze, about seven or eight inches in length, and five or six in breadth; and which, from its shape, would appear to have been better adapted for cutting up the roots of brush-wood, furze, broom, or other coarse shrubs, than for paring off the surface of a field free from such incumbrances. This instrument is, however, it is said, common in the south, western districts; and that, though it no doubt retains in a great measure the shape of the instruments first used for the purpose in that part of the country, when the lands were in very different state; yet the labourers, who are in the practice of using it, are able to pare off the sod with great dexterity and dispatch. But in other districts, where the sod is pared off by manual labour, the ordinary breast-spade, (in some places called the breast-plough, and in Scotland the slaughter-spade,) is mostly employed. The iron, or cutting part of this implement, is about eight or nine inches in length, and from ten to twelve inches in breadth, having frequently a kind of edge rising up a few inches at the right-hand side of the turf, next the unmoved sward. This instrument, which is formed with a fine edge, is forced forward by the strength of the arms of the person using it, and by pressing the breast against that part of the frame or shaft which is held in the hand. In working the tool,

PARING.

the labourer generally cuts the fods at about an inch or an inch and a half thick, and from ten to twelve inches broad; and when the spade has run under the fod to the length of about three feet, he throws it off by turning the instrument to one side, and proceeds in the same way, cutting and throwing over the fods, the whole length of the ridge. In this way of performing the operation, the labourers, by following each other with a slice of the fward or surface of the land, accomplish the business with much ease.

There is another implement that is sometimes used for paring the fod, which is the *horse-paring-plough*, and is made of different constructions, according to the circumstances of the ground to be pared. In the fenny districts on the eastern coasts, where paring and burning are practised on a large scale, they have ploughs constructed for the purpose of a particular form, but which vary from the common ploughs chiefly in the breadth and sharpness of the share or sock. They are admirably calculated for paring off the fward or fod of such grounds as are level, and where neither stones, brush-wood, ant-hills, nor other impediments obstruct their progress; but where such obstructions present themselves, the breast-spade, or common team-plough, with a small alteration of the share, will be found preferable, both in respect to the extent of ground that can be pared, and the superior manner in which the work in such cases can be performed. Ploughs, from their great expedition and regularity of performing the business, should always be made use of where the nature and situation of the land will admit them, in preference to such tools as require manual labour. In some of the western counties the common plough only is used. There the old grafs fields, when it is proposed to burn the fward, are rib or slob-furrowed about the beginning of winter; and being again cross-ploughed the following spring, the fods are collected and managed in the manner mentioned in speaking of skirting. In those cases the plough has, however, a wing turned up on the furrow-side of the plough-share, by which the furrow is cut any breadth required. The work is also sometimes done by means of the spade, mattock, and breast-plough, in such cases.

Mr. Young states, that in the fens of Cambridgeshire, upon a peat soil, free from large roots and stones, the work of paring is always done with a plough, which they make on purpose for the work, and which executes it in the completest manner that can be imagined. It turns off a furrow, from 12 to 16 or even 18 inches broad, and not more than an inch deep. The use of this admirable tool brings down the whole expence of paring, burning, and spreading the ashes, to 9s. or 10s. *per acre*. But upon those soils, when they have not been in a state of cultivation, such a plough would not work.

But in old meadows and pastures, this sort of work is done with the breast-plough, as it is called, which is pushed on by strength of body, the thighs being armed with wooden guards. It is hard work, and now commonly paid for, including burning and spreading, from 25s. to 40s. *per acre*. An inch, or an inch and a half, is the common depth; but some farmers prefer two inches, for the sake of more ashes. The thinner it is pared, the more certain the burning, should the weather prove unfavourable. Considerable tracts of heath and down-land, on a weak, thin, loamy sand, with a calcareous bottom, have, within the last five years, been thus broken upon Newmarket-Heath, at the expence of 36s. *per acre*, and immense crops the consequence. And the moors and mountains of the north of England, Wales, Devonshire, &c. when broken up for cultivation, are often,

and ought always to be reduced by this practice. It has long been common husbandry in those counties, and is, therefore, done cheaper, from 24s. to 30s. *per acre*. However, draining should precede it.

The months in which the greatest quantity of land is pared and burnt, are April, May, and June. The particular period must, however, always depend much on the state of the weather, the nature of the crop, and the farmer's convenience. When the east winds prevail, in February and March, this sort of business may sometimes be carried on. But for accomplishing the work with the greatest dispatch, and also with the least trouble and expence, a dry season is obviously the best. The prudent farmer should not embark in the undertaking, unless there be a reasonable probability of his accomplishing it while the weather keeps dry and favourable. The latter end of May, or the beginning of June, when the hurry of the spring seed time is over, in the more northern districts, when a number of hands can be most easily procured, may upon the whole be considered as the best and most convenient season; as at this period the green vegetable products are in their most succulent and full states, and of course may probably afford more saline matter; but in the more southern counties either a much earlier season must be taken, or the interval between the hay season and the harvest time must be fixed upon, the latter of which is, on the principle just stated, evidently the best, where the extent of ground to be burnt is not too large. In other seasons it would frequently be impossible to procure a sufficient number of hands for performing the business. In bringing waste lands into cultivation, where an extensive tract of ground is to undergo this process, the autumn may, in many cases, afford a convenient opportunity for the operation.

As the crops, that are sown after paring and burning, are various, and as the season for performing the process, in many cases, depends, in some measure, on their nature, it may be observed, that when rape or turnips, which are the most prevailing crops in such circumstances, are to be cultivated, the end of May or the beginning of June will be the most proper time: but if barley or oats are to be sown, the paring and burning must be completed as early in spring as the nature of the season will admit; and when lands are pared and burned as a preparation for a crop of wheat, July, or even the beginning of August, may, in favourable seasons, answer; but it is better to have the ground ready sooner if possible.

The depth to which lands of different qualities may be pared with the most advantage differs much; but as it can hardly be proper to pare light, thin, stapled soils, to the same depths as those of the more deep and heavy kinds, it should, in some degree, be regulated by their particular nature, and their differences in respect to depth and heaviness. Mr. Boys, however, who is in the habit of breaking up thin chalky soils, and such as have been in tillage this way, observes, that in Kent, where the method of paring most in use is with down-shares or breast-ploughs, they take off turfs as thick as the nature of the soil will admit, from half an inch to two inches; the thicker the better, provided there be a sufficient portion of vegetable matter contained within them to make them burn well. The most usual depths of paring are from about one to three inches.

Burning.—When the season is not very wet, the turfs will commonly be sufficiently dried in about a fortnight or three weeks, even without being turned; but in rainy weather they require a longer time, and must be turned more than

PARING.

than once to prevent their striking out roots and shoots, which might hinder them from burning. And that as soon as the turfs have fully undergone the process of burning, and are reduced to the state of ashes and a powdery earthy matter, the whole should, as soon as possible, be spread out over the land in as regular and equal a manner as the nature of the work will admit of; for, without great attention in this respect, great inequality in the crops may take place; besides, the soil will be made lighter in some places than in others, which may be disadvantageous in the same way. The spreading, where it can by any means be accomplished, should always be performed before any rain falls; as where this point is not attended to, a great loss may be sustained by the saline matters being carried down in a state of solution, and their beneficial effects in a great measure lost before the crops are in a condition to receive them. In order to secure the full influence of the ashes, the land is frequently slightly ploughed over immediately after the ashes are spread out. And Mr. Donaldson states, that those, who are more than ordinarily attentive in this respect, only rib or slob-furrow the field, so that the ashes may be got covered up with the greater expedition and dispatch. By this mode they cannot probably, however, be so equally mixed with the soil as by that of ploughing the whole field with a very slight furrow, so as just to cover them. It is remarked by Mr. Young, that in this business, the heaps should not be made large, twelve or fifteen bushels of ashes are large enough; twenty may be admitted, but if much larger, the turfs will be too much burned. This must, however, depend, in some measure, on the weather, for the worse that is, the larger the heaps must be. It will also depend on the thickness of paring. Thin flags will burn in smaller heaps than thick ones.

It is evident that the expence of the operation of paring and burning must vary according to the nature and situation of the land, the method in which it is performed, and the customs of the district in regard to the price of labour. On the thin sort of chalky soils it is stated by Mr. Boys, who is accustomed to have such land prepared by this means, that the expence for paring at a moderate thickness, where the land is not very stony, is twenty shillings *per* acre; for laying it up in heaps and burning, ten shillings; and for spreading the ashes, three shillings; and that a coat of manure is thus produced on the land of from eighty to one hundred and sixty cart loads *per* acre, for the trifling expence of thirty-three shillings. A hundred cart-loads of dung purchased from neighbouring towns and villages, at the distance of three miles from the land, would cost, carriage home included, ten times the price of down-harrowing, and yet would not improve the land more. But that, where the land is well covered with turf, it may be ploughed for burning about two inches deep, with a common plough, drawn by a pair of horses, early in the spring, and as soon as a drying wind sets in, the turf be laid in heaps, and burnt by labourers for one pound one shilling *per* acre, which will produce near two hundred cart loads.

In some fen districts, where the original surface is rough and unequal, from great tufts of rushes, &c. called haffocks, Mr. Young states, that some persons cut them with spades at the expence of five or ten shillings an acre, and others with the plough. Paths for the horses are in that case to be cut by hand, and the plough made on purpose, and called a-haffock plough, cuts laterally much beyond the line of its draught. But opinions are said to be in general, that the hand-work is the cheaper; in either case, the haffocks are dried, heaped, burnt, and the ashes spread. After this they go over it again with a very complete and effective tool,

called a fen-paring plough, the furrow of which is burnt: the expence of this business in different cases has been shewn above.

Cropping.—In the management of land by this process, it is necessary to attend to such a mode of cropping as will tend to its improvement, whatever may have been the manner or kind of soil in which the process was performed. Without a nice and exact attention in this respect, much injury may frequently be done, and an useful practice be brought into disrepute. Where the nature and situation of the land will admit of them, as in the lighter sorts of soils, the growing of turnip or rape crops, to be consumed on the ground, would seem to be most proper for the first year; then a white or grain crop, as oats, or wheat; after that turnips again, or, in some cases, peas, beans, or some sort of green crop, to be eaten off, if possible, by sheep; and lastly, a grain crop with grass feeds: but on the heavier sorts of lands, where the turnip husbandry cannot be so well introduced, cole, clover, and bean crops, may often be interposed between those of the grain kinds with the most propriety and advantage. And it would seem that the interposition of green crops ought on the whole to be more frequent in the former sorts of soil than in those of the latter, on account of their containing, in general, a less proportion of vegetable matter. It is often attended with great advantage to apply some sort of manure, such as lime, with the second crop of turnips in cases of these kinds. It has been observed by Mr. Young, that upon high moors, in undertaking new improvements, it may be of singular importance to gain straw. In that case, to sow cats upon the first burnt lands may be admitted, but in general it is much more correct to leave the ashes ploughed in for sowing turnips, upon all the land burnt in March, April, or May. This preparation is unexceptionable for potatoes, so that if this root be wanted, it may be planted in April on the land burnt in March.

It is stated to be the practice in some of the western districts, where the method of paring and burning is much practised, and in high estimation, that old sainfoin lays, and all such swards as are of a sufficient texture, are usually broken up in this way. Turnips are frequently the first crop; and from the freshness of the land, and the good effects of the ashes, a large crop is mostly produced. But as in those cases the time is too short to get the land in proper tilth for the succeeding crops of barley, grass feeds, and other similar crops, it is often adopted as a better method to sow wheat in the first instance on one ploughing; after which, from the ashes being still fresh in the ground, a crop of turnips may be as certainly depended on, and there is a sufficient length of time to get the land into a complete state of tilth. Mr. Young speaks of this as the best method, on account of the danger of grain crops being destroyed by the red worm, which abounds much in such layers. Wheat stubbles, of the more grassy kinds, which will produce a tolerable quantity of ashes, are also frequently pared and burnt for turnips with a considerable degree of success. In short, when this practice is properly followed up with the turnip and clover husbandry, its good effects cannot, it is conceived, be disputed in any respect. And in other districts cole-feed is sown on a shallow ploughing, and never harrowed. This is intended either for a crop of seed, or for sheep-food: in the latter case, it sells in some places for a guinea an acre; in the former, for two or three guineas. Oats are then sown; the crop is productive, and the land, if well laid down to grass, becomes good meadow. But the management in this respect is frequently, it is observed, very bad, only clover and ray-grass being sown, and after

PARING.

fix or seven years pared and burnt again; instead of which, if proper seeds were sown, the land would be ever after in a state of improvement. On this, Young remarks, that, one peculiar circumstance attending the breaking up of grass lands, whether old turf or sainfoin lays, in this manner, is the bringing them into order for turnips with only one ploughing; and it is a general and very just observation, both in the north and west of England, where this husbandry is most common, that turnips scarcely ever are known to fail on burnt lands: the fly on such is nearly unknown. Now any farmer must be sensible of the vast importance of thus bringing turf lands by only one ploughing to a turnip crop; much tillage is thus saved as well as a great expence, and the turnips are generally a crop that repays the expences of the operation with profit. In a word, this husbandry deserves the warmest praise.

An able writer states, that where there are poor, wet, cold, hungry pastures and neglected meadows, over-run and filled with all sorts of rubbish, and abounding with too few good plants to render their improvement easy without breaking up, that these should be pared and burnt; not to keep under the plough, to be exhausted and ruined, which is infallible, and the land left in a worse state beyond all comparison than it was before, but to be laid immediately to grass, that is, as soon as the course of husbandry necessary will admit. This, it is conceived, ought to be without variation, under any pretence whatever, in this course of crops: 1st. Pare and burn for turnips to be fed on the land with sheep: but in moist-bottomed lands, rape will often succeed better than turnips: and the sheep feed better with rape upon such lands. 2dly. Oats; and with these oats the grass seeds should be sown. The oats and the turnips, it is asserted, would more than pay all the expence of a previous hollow draining, should that be necessary; of the paring and burning, and every other charge; and the change, from a very bad pasture to a very fine one, would all be neat profit. The tenant, it is contended, would be greatly benefited, and the landlord find his estate improved, if let, as farms ought to be let, with an absolute exclusion of selling a lock of hay under any pretence whatever. And that this method is practised with great success in the fen land in Lincolnshire, the business being performed by means of the plough, and cole-seed afterwards sown. In some cases, horses and ploughs are found, and the labour put out, which, including a ploughing in order to turn in the ashes, is done at seven shillings an acre: the cole is fed with sheep, and is worth three pounds an acre; but the selling price forty to fifty shillings. Then oats, eight quarters an acre, and ten quarters have been had; then cole and oats again; being laid down with fourteen pounds of white clover, and one peck of ray grass, lets at twenty shillings. It is found to be a great and lasting improvement of the land. This is conceived to be a low estimate, from the land keeping five sheep an acre, from Lady-day to Michaelmas, and one and a half on the acre in the winter. Where then, it is inquired, is the supposed mischief of this practice?

And there are other sorts of lands, as dry, rough sheep-walks, covered with ling, furze, broom, &c. which should also be broken up in the same manner, but universally to be laid down again with the grasses suitable to the soil and to sheep. On weak, thin, staped land, two crops of corn, after paring and burning, may often be pernicious. Perhaps they might be well laid down without a single one, which would be a better method of management. It is also supposed by some able agricultors, that it would be better to take, in such cases, two or three successive crops of turnips, in order to completely eradicate all the seeds of

the ling, furze, and broom, before the land is laid down to grass, as otherwise these plants may appear with redoubled vigour. These observations seem just, and to be founded in good sense, reason, and experiment; they place the absurdity of indiscriminately condemning this mode of agricultural improvement in the clearest point of view; as the injury that may take place in some cases may be occasioned by an injudicious and improper method of cultivation. In Kent, Mr. Boys observes, that, of all the improvements in the cultivation of land that have hitherto been made use of in that district, this stands foremost; some of the very worst land having been made to produce excellent crops; and poor chalky downs, of scarcely any value in their original state, are by it made to produce good turnips and clover, and crops of corn often equal in value to double the fee simple of the land. Instead of the land being injured by the operation, as some theoretical writers have imagined, provided it be under a proper system of management and fairly dealt by, it is put into a progressive state of improvement from the time of its surface being burnt. It has frequently happened, that land after burning has been sown with corn four or five years in succession without being folded with sheep, or any part of its produce ever returned in manure; even charlock and other weeds have been suffered to remain, by which it has been annually burthened with a double crop: hence it has been left in an impoverished state, and the burning is unjustly condemned for the mischief done by the negligence and rapacity of the cultivator. Let the land, when burnt, be perfectly cleaned from charlock and other weeds, by growing turnips until the weeds are totally eradicated by hoeing, &c. Let the turnips be fed off the land, by sheep lying on the land day and night; then sow it with barley and clover: the latter to be fed off with sheep, folding them on the land for wheat. Lastly, return the straw produced upon the land in manure, mixed with clay or loam, or any other fresh earth that is near at hand, for a second Norfolk rotation, which may be repeated; or the land may be sown with sainfoin, to remain till a turf is formed fit for paring and burning again. This plan being pursued, the practice of burning the soil will not give any cause of complaint either to landlord or tenant. Theorists exclaim that by paring and burning, the staple of the land is reduced, and the soil is watted; which may be somewhat true: but all this is very immaterial, if fine crops of corn can be produced where none ever grew before, and the land at the same time be improved.

Mr. Young, in speaking of cropping repeatedly with white or grain crops after paring and burning, strongly remarks, that if a dung-hill were given to a bad farmer, and it was used on similar principles, it would almost equally exhaust the soil; yet who has found out that dunging land is bad husbandry? Paring and burning give a dung-hill also; it is bad management alone that converts it into an evil. Make it the preparation for grass, and all is safe. It has also been stated, that the practice of paring and burning is so advantageous in some cases, as to render lands, the produce of which was not worth two shillings and sixpence, in the course of four years capable of producing two valuable crops of corn, and as many turnips, and to be rented at twenty shillings *per* acre.

A very intelligent farmer, in the fifteenth volume of the Annals of Agriculture, has given the following statement of the expences and returns of breaking up fresh land of a stiff loamy quality by means of this process, and cropping it with oats and peas. The summer in this instance was lost for preparing the ground for a wheat crop. The crops are here charged with rent and taxes for two years.

I. *Oat Crop.*

	£	s.	d.
Rents <i>per</i> acre, two years poor rates, and road levy	1	4	0
Striking the bushes and levelling willocks	0	10	6
Paring and burning, and spreading the ashes	1	10	6
Once ploughing and harrowing	0	12	0
Seed oats four bushels, at 29s.	0	11	0
	<hr/>		
	4	8	0
	<hr/>		
Sold seven quarters of oats at 1 <i>l.</i> 1 <i>s.</i> 0 <i>d.</i> <i>per</i> quarter	7	7	0
Seeds and expences	4	8	0
	<hr/>		
Profit <i>per</i> acre	2	19	0

Straw not charged, but set against the expences of mowing and threshing, which it more than defrayed.

II. *Pea Crop.*

	£	s.	d.
Expences the same as for the oat crop, with the addition of 5 <i>s.</i> for four bushels of seed at 3 <i>s.</i>	4	3	0
Sold four quarters of peas at 32 <i>s.</i>	6	8	0
	<hr/>		
Profit	2	5	0

And from the ameliorating nature of pea crops, and the excellent state in which they leave the land for a crop of wheat, they will, it is supposed, be on the whole more advantageous than the oats.

In Yorkshire, the expences and profits on cold, mossy, old meadow land, with a north-east aspect, cultivated in this manner for turnips, as given in the same work by the writer of the Middlesex Survey, is this :

Expences and Profits.

	£	s.	d.
Paring, drying, and burning, with spreading the ashes, <i>per</i> acre	0	15	0
Ploughing once over and harrowing	0	8	0
Seed $\frac{3}{4}$ lb. and sowing with weeding, which in land thus prepared is but little required	0	1	0
Rent, tythe, taxes, and assessments	0	18	0
	<hr/>		
	2	2	0
	<hr/>		
Turnip crop plentiful, large sizes, about a foot distance, estimated in feeding stock by the acre at	5	0	0
Seeds and Expences	2	2	0
	<hr/>		
Profit <i>per</i> acre	2	18	0

It is noticed, that in that neighbourhood, the usual agistment price is sixpence a week for fattening wethers, and three-pence a week for hogs (lambs of the preceding year) to eat the broken turnips and shells left by the wethers.

These expences of the process of paring and burning are much too low for the present period.

In what respects the kind of grafs-seeds that may be proper after this operation, they must probably be different, according to the nature and quality of the soil. In the light forts of land, those kinds of grafses that cover the earth well may be most suitable. On chalky soil, sainfoin may frequently be employed. In the fenny forts of soil, marl-grafs with a little meadow fox-tail grafs, will often be found beneficial. And a small mixture of the finest ray-grafs, or darnel, is likewise found to answer well. Marl-grafs, though it has some resemblance to red clover, is materially different in its effects; the former being found unfriendly to all natural grafses, while the latter is quite the reverse. This is a fact that has been established by extensive experience. One other very material advantage resulting from the cultivation of marl-grafs, is, that neat cattle are not so liable to swell by eating it in moist weather, as they are with red clover. The heavy or clayey soils will in most cases require the largest proportion of grafs-seeds to be sown upon them, in laying them down after being prepared by the process of paring and burning.

In short, it may be concluded, that from the great ease and expedition with which all those coarse forts of land, which have been mentioned as proper for being broken up by this means, are rendered fit for the growth of crops of different kinds, such as those of grain, rape, turnips, &c. as well as from the very abundant produce which is generally the case after such preparation, that where proper attention is paid to the process, and the method and management afterwards, it must be highly beneficial, and probably the best that can be adopted. It has indeed been remarked, in the able Survey of the North Riding of Yorkshire, that when the husbandry that succeeds paring and burning is judicious, no mode of improvement can be compared with it; for it is *certain* to produce *great* crops of turnips and grain, and these are *certain* means of future fertility in the hands of a judicious farmer.

PARING-Plough, an implement of great utility in many cases, where the system of paring and burning is practised. At *figs.* 1 and 2 in the plates on ploughs, are two side views of a paring-plough, recommended by Mr. Young for rough land. It has the share six inches in width, by means of the pivot *a*, which screws into the holes *b*. It is said to be capable of performing its work in a good manner, where the fen paring-plough cannot stir at all. It is said to have been in use at Sheffield Place, the seat of lord Sheffield, thirty years ago; having been obtained from Cheshire, where it had been made use of on the farm of sir George Warren. See the preceding article.

PARING-Spade, a sort of spade which is made use of in paring land for burning, being made with a crooked handle, so as to be pushed forward in using by the breast. It is sometimes termed a breast-plough.

PARING the Hoves of Horses, in the *Manege*, a kind of operation in shoeing, performed on the feet of these animals, with the intention of adapting or suiting them to the shoes. The business is executed with a sort of edge tool, which is called a butteris, and is often done to the great injury and prejudice of their feet. As it is unquestionably the object in shoeing horses to preserve the hoof, as well as to defend the sole, it cannot, of course, be necessary to pare away what is wanted to be kept in a state of preservation. This is consequently a practice that should never be submitted to either with farm or other horses, except in cases where the horny sole is so very uneven, that the shoes cannot be otherwise made to bear equally upon the feet, which would take off

off from the requisite firmness of them. It may perhaps sometimes be proper in such instances as these, but in other cases it is highly absurd and mischievous, being not unfrequently the occasion of great injury and inconvenience to the animals. See HORSE and SHOING.

PARING the Sole, in shoeing horses, an improper operation which is too often performed on the horny parts of the feet of these animals in fixing the shoes upon them, and from which injury not unfrequently arises.

PARINO, in *Geography*, a town of Mexico, in the province of Culiacan; 42 miles E. of St. Miguel.

PARIPE, a town of Brasil, in the government of Bahia.

PARIPURA, a river of Brasil, which runs into the Atlantic, S. lat. $9^{\circ} 42'$. W. long. $35^{\circ} 26'$.

PARIS, MATTHEW, in *Biography*, an early English historian, was a monk of St. Albans, who flourished during the middle of the 13th century. He is described as a man of almost universal accomplishments; he was a mathematician, poet, orator, theologian, painter, and architect. He was employed to visit the monasteries and revive their decayed discipline, and without hesitation he censured what he found wrong in all orders of people. His principal work is his "*Historia Major*," which is a history of English affairs from the conquest to the 43d year of Henry III. It was published by archbishop Parker at London in 1571. It is supposed originally to have had a first part commencing with the creation, and coming down to William the Conqueror. It is reckoned a very valuable work, composed with exactness and much candour; and displaying great freedom in exposing the usurpations of the Roman see, upon the prerogatives of the English kings, on which account it incurs the censure of Baronius, who otherwise is inclined to give it great commendation. It was republished with additions, and the author's lives of the abbots of St. Albans, in 1606, by Dr. William Watts. Matthew Paris also composed a "*Historia Minor*," being an abridgment of the former, with additional circumstances. He wrote other works, which are lost or lie concealed in libraries.

PARIS, FRANCIS, generally known by the name of the *abbé Paris*, and rendered famous for a time by the impostures and delusions which were practised at his tomb, was the eldest son of a counsellor to the parliament, and born at Paris in the year 1690. His father wished to bring him up to the law, in order that he might have him for an assistant in his business, and that eventually he might become his successor, but he preferred embracing the ecclesiastical life, and was accordingly admitted to deacon's orders. Upon the death of his father, he renounced all claim to his patrimonial inheritance, in favour of a younger brother, and devoted himself to what he thought was a life of meritorious poverty. Having made trial of different places of solitude, he at length fixed upon a house in the suburb of St. Marcel, at Paris, where he spent his time in prayer, and the most rigorous acts of penance; hence he acquired a character for extraordinary sanctity with the superstitious populace, who thought such mortifications the very perfection of virtue. He died in 1727, at the age of thirty-seven. His brother erected a tomb to his memory in the cemetery of St. Medard, and so highly was his piety esteemed, that many persons who had, during his life, been edified by his instructions, went to visit his monument, and some pretended to be cured of their diseases on their approach to the grave. This induced others to do the same, and so great was the delusion, that government was under the necessity to order the cemetery to be closed up with lofty walls. Accounts were published of at least an hundred miracles said to have been wrought on the spot. The *abbé Paris* was author of a

"*Commentary on the Gospel of St. Matthew*," and "*An Explication of some of St. Paul's Epistles*."

PARIS, in *Geography*, the metropolis of France, is situated on a plain, through which the river Seine flows in a most pleasing and picturesque manner.

History and Extent.—Cæsar is the first historian who makes mention of this city. In the seventh book of his Commentaries, that conqueror relates that he sent his lieutenant Labienus towards Lutetia, which was the name given by the Gauls to the capital of the Parisii. It was then entirely contained within that island on the Seine, which, at the present day, is called l'Île du Palais; and in comparison with the capitals of the other provinces of Gaul, Lutetia was but a sorry village; its houses were small, of a round form, built of wood and earth, and covered with straw and reeds. When the Romans had conquered Lutetia, they embellished it with a palace, surrounded it by walls, and erected at the head of each of the two bridges leading to it, a fortress, one of which stood on the site of the prison called "Le Grand Châtelet;" and the other, on that of "Le Petit Châtelet." The Yonne, the Marne, and the Oise, being rivers which join the Seine, suggested the idea of establishing a trading company by water, in order to facilitate, by those channels, the circulation of warlike stores, and provisions. The merchants were called "Nautæ Parasiaci." The Romans also erected, near the bank of the Seine, a magnificent palace and aqueduct. This palace was called Thermæ, on account of its tepid baths. Julian, being charged to defend Gaul against the irruptions of the barbarians, took up his residence in these Thermæ in the year 360, two years before he was proclaimed emperor, in the square which was in the front of the palace. "I was," says he, in his work entitled "*Misopogon*," or *the Enemy of the Beard*, which, says Gibbon, still remains a singular monument of the repentment, the wit, the humanity, and the indiscretion of Julian, "in winter quarters in my dear Lutetia. Thus is named, in Gaul, the little capital of the Parisii." And by another ancient writer, it is described as an inconsiderable island, surrounded by walls, the foot of which is bathed by the river. The entrance to it, on each side, is by a wooden bridge. Towards the middle of the fifth century, this city passed from the dominion of the Romans to that of the Franks, and in 508, Clovis declared it the capital of his kingdom, and he contributed very much to the embellishment of it. Charlemagne founded in it a celebrated school, and in a short time after, another was established in the abbey of "St. Germain-des-Près." In the course of the ninth century, it was besieged and pillaged three times by the Normans. Philip Augustus surrounded Paris with walls, comprising in the enclosure a great number of small towns and hamlets in its vicinity. The undertaking occupied about twenty years, having been begun in 1190, and finished in 1211, and this monarch was the first who caused the streets to be paved. The wars with the English required new fortifications, and in the reigns of John, and Charles V., in the fourteenth century, ditches were dug, and the Bastile erected. Francis I., the restorer of literature and of the arts, neglected nothing that might conduce to the embellishment of this capital. He caused new streets to be made, many Gothic edifices to be pulled down, and was, in France, the first person who revived Greek architecture, the remains of which, buried by the hand of time, or mutilated by that of barbarians, being collected, began to improve the genius of celebrated artists, and in the sequel led to the production of many fine master-pieces of art. The successors of Francis executed a part of his projects, and

this extensive city imperceptibly lost its irregular and Gothic aspect. Henry IV. was the first of the kings of France who embellished Paris with regular squares, or open spaces, decorated with the different orders of architecture. Having nearly finished the Pont Neuf, he built the Place Royale, and also the Place Dauphiné. During the reign of this king several handsome streets were built and finished in a year. In the reign of Lewis XIV. Paris knew no limits. Its gates were converted into arcs of triumph, and its ditches, being filled up and planted with trees, became public promenades. Paris, however, was not the favoured city of this prince, for had he expended on it a fourth part of the money which he lavished on Versailles, it would have become the most astonishing city in Europe. It must however be admitted, that its great extent and population, magnificent edifices, celebrated national establishments of learning and science, rich libraries, curious cabinets, where lessons of knowledge and genius present themselves to those who have a taste for them, together with its theatres, and other places of public entertainment, have long rendered Paris deserving of the admiration of enlightened nations. Before the revolution, Paris contained 46 parish churches, and 20 others answering the same purpose, 11 abbeys, and 133 monasteries or convents of men and women, 13 colleges, 15 public seminaries, and 26 hospitals. To these must be added the three royal habitations, the Louvre, the Tuilleries, and the Luxembourg, also the Hotel des Invalides, the Palais Royal, and the Palais Bourbon. Since the revolution several of these buildings have been destroyed; almost all the monasteries and convents, together with the churches belonging to them, have been sold as national property, and either demolished for the sake of their materials, or converted to different uses.

Population.—The number of houses in Paris, many of which are from five to eight stories in height, has been estimated at upwards of 80,000, and by an official statement a few years since, the number of inhabitants, exclusive of foreigners, was about 630,000. During the last year of the republic, the number of males born at Paris was 9296; and that of females 9177, making the total number of births to be 18,473, of which 3644 were born out of wedlock, that is, nearly one in five. The number of persons who died in the same period was 10,446 males, and 10,301 females, making together 20,747, causing an annual decrease in the population of 2274. The number of marriages was 3826, and that of divorces 720, nearly two in eleven.

Divisions and Barrières.—Paris is divided into twelve mayoralties, each of which is presided over by a central officer of the municipal police. The faubourgs retain their ancient names, but those of many of the streets have been changed since the revolution. In proportion as the limits of the capital became extended, the real gates were removed, but they re-appeared under the name of *barrières*. These edifices, many of which were very costly, were constructed during the ministry of Calonne, under the direction of Ledoux, the architect, who has taken pleasure in varying their form and character. One represents an observatory; another, a chapel; some have the appearance of rusticated buildings; others of temples. There are about sixty of these barrières, which, during the revolution, were frequently shut to serve the purposes of party, and to favour the arrest of particular persons: they are now occupied by custom-house officers, whose business is to collect duties, and to watch that no contraband goods find their way into the city.

The Seine and Quarries.—The river Seine, to which we

have already referred, is justly esteemed one of the most beautiful in France; it is of a light sea-green hue, a singularity which adds to the effect of the noble bridges and quays. This colour is not observable before the junction of the Seine and Marne, where it may be clearly observed to belong to the latter stream, the Seine being of a brown or muddy appearance, while the green hue of the Marne continues unpolluted for a considerable space. Towards the north this plain is bounded by a semicircular range of gentle elevations, mostly composed of gypsum, or alabaster, which by combustion yields the noted *plaster of Paris*. This substance is much used in the construction of houses. The calcareous free-stone, with which the superior hotels are built, is drawn from quarries on the south of the city. The ancient quarries are without the southern bounds of the original city, in the form of catacombs, or narrow passages of great regularity.

Soil, Climate, and Streets.—The soil on which the city stands is various. On the south of the river it is calcareous free-stone, frequently intermixed with shells; while on the north, as far as the streets that rise in the skirts of Mont Martre, it consists of alluvial sand to a considerable depth, followed by the gypsum of Mont Martre. "It is," says Mr. Pinkerton, "a well-known singularity in geology, that the banks of the rivers are often composed of different substances, owing, probably, to some natural incoherence, which afforded an easier course for the water to penetrate." The fossil bones found at Mont Martre are, by Cuvier, supposed to belong universally to different species and sizes of an animal now extinct but approaching nearest to the tapir of America. And the sea-shells, some of them unknown at present in the Atlantic, discovered at Grignon, to the west of Versailles, in a bed of sand, under a layer of solid lime-stone, indicate changes in the globe which it is impossible to account for. The climate of Paris differs from that of London in the superior heat of the summer, which matures the grape in the open vineyard, a circumstance totally unknown in England. The general warmth of the year is much the same at Paris as at London, the superior cold of the winter balancing the heat of the summer. In the winter of 1802-3, the river Seine was frozen over during a fortnight, and the cold was intense. Pinkerton says, that he always thought that the environs of Mont Martre were colder than any other part of Paris, not only from the greater height of the situation, but from the proverbially cold nature of the alabaster. In Paris the streets are very narrow and crowded, yet even amidst the inconveniences arising from these circumstances, the superior magnificence of the houses and public buildings is very striking, especially to a person who, after a long residence at Paris, returns to London. While the latter is enveloped in clouds of smoke, none is perceivable at the former, except at the moment of lighting the fires in the morning; and a spectator from a neighbouring eminence is dazzled with the white splendour of the houses and towers. The Parisians have an universal prejudice against the use of coal, which they conceive to be very unhealthy, and hurtful to the lungs. The smoke of wood, though more prejudicial to the furniture, the colour of which it soon changes, is yet scarcely visible in the open air, while that of coal blackens the surrounding objects, as appears but too certainly from the dark hue of our London churches and other stone buildings. The Parisian edifices, on the contrary, are of such dazzling whiteness, that in the summer the eye is fatigued, and seeks for the repose of some milder colour.

Public Buildings.—It has often been made a question, whether Paris or London is to be reckoned the finer city; according,

ording, however, to a well-informed traveller, London is said to be the more imposing to the eye as a whole, but Paris will better bear dissection. The wide streets and broad foot pavements in London give a general impression of grandeur, but the public buildings that can be noticed as really fine ones are few. At Paris, while the city does not give an impression of grandeur as a whole, the objects which, taking it in detail, claim particular attention, are grand and numerous. There is nothing in London which can be compared to the quays at Paris along the Seine, from the Pont Neuf to the end of the town on the west, particularly the quay on the right bank; along which run, in succession, the Louvre, the great gallery of which joins it to the Thuilleries, the Thuilleries itself with the gardens, the Place de la Concorde, and the Champs Elysées. The origin of the Louvre, as well as the etymology of its name, is lost in the darkness of time. It existed under that name in the reign of Philip Augustus, who surrounded it with ditches and towers, and made it a fortress. The great tower of the Louvre, celebrated in history, was insulated, and built in the middle of the court. All the principal feudatories of the crown derived their tenure from this tower, and came hither to swear allegiance, and pay homage. It was likewise a prison previously prepared for them, if they violated their oaths. The Louvre received also from this enormous tower a melancholy and terrifying aspect, which rendered it not at all adapted to a royal residence. Charles V. endeavoured to enliven it, and made it commodious for those times. Several foreign monarchs successively lodged in it, such as Manuel, emperor of Constantinople; Sigismund, emperor of Germany; and the emperor Charles V. The large tower of the Louvre, which, at different periods, had served as a palace to the kings of France, as a prison to the great lords, and as a treasury to the state, was at length taken down in 1528. The part of the palace which at present is denominated the Old Louvre, was begun under Francis I., but was first inhabited by Charles IX., under whom it became the bloody theatre of treacheries and massacres, on the infamous St. Bartholomew's day, which time will never, and ought never, to efface from the memory of mankind, and which, till the merciless reign of Robespierre, were unexampled in the history of that country. In after-times this palace became the quiet and happy cradle of the arts and sciences, the school for talents, the arena for genius, and the asylum of artists and literati. The centre pavilion over the principal gate of the Old Louvre, was erected under the reign of Lewis XIII. from the designs of Mercier, as well as the angle of the left part of the building, parallel to that built by Henry II. The eight gigantic *cariatides* (see the article), which are to be seen there, were sculptured by Sarrafin. The several parts of this palace which were constructed under the reigns of Charles IX. and Henry III., partake of the taste of the times, in regard to the multiplicity of the ornaments; but the interior announces, by the majesty of its decorations, the refined taste of Lewis XIV. The part of the Louvre, which, with two sides of the old building, forms the perfect square about 400 feet in extent, called the New Louvre, consists in two double façades, which are still unfinished. The colonnade of the Louvre, which is the master-piece of French architecture, and the admiration of Europe, was built by Perrault. The façade of this colonnade, which is of the Corinthian order, is about 525 feet in length; it is divided into two peristyles, and three avant-corps. The principal gate is in the centre avant-corps, which is decorated with eight double columns, crowned by a pediment, whose cornices are composed of two stones only, each fifty-four feet in length by eight

in breadth, though no more than eighteen inches in thickness. They were taken from the quarries of Meudon, and formed but one single block, which was sawed in two. The other two avant-corps are ornamented with six pillars, and two columns of the same order, and disposed in the same manner. On the top, instead of a ridged roof, is a terrace, bordered by a stone balustrade, the pedestals of which are intended to bear trophies intermixed with vases. In front of this magnificent colonnade, a multitude of salesmen erect their stalls, and display their various articles. This contrast still speaks to the eye of the attentive observer. It is the image of all the rest,—grandeur and beggary side by side. The front to the river is handsome, but not to be compared to the other, and that is unfinished. The other two fronts are so encompassed by houses, that they are scarcely seen at all. The inside of the court, like the rest of the building, will be handsome, and extremely grand, if it be ever finished.

The great Gallery which joins the Louvre to the Thuilleries is more than 1200 feet long. The Palais des Thuilleries was so called, because a tile-kiln formerly stood on the site where it is erected. At that time, this part of Paris was not comprised within its walls, nothing was to be seen in the vicinity of the tile-kiln, but a few coppices and scattered habitations. The construction of this palace was begun in May 1564. At first, it consisted only of the large square pavilion in the centre of the two piles of building, which have each a terrace towards the garden, and of two pavilions, by which they are terminated. Henry IV. enlarged the original building, and in 1600 began the grand gallery which joins it to the Louvre. Lewis XIII. made some alterations in the palace, and in 1664, Lewis XIV. directed it to be finished, by making the additions and embellishments which have brought it to its present state. These deviations from the first plan have destroyed the proportions required by the strict rules of art; nevertheless the architecture, though variously blended, presents, at first sight, an *ensemble* which is magnificent and striking. The whole front of the palace consists of five pavilions, connected by four piles of building, standing on the same line, and extending for the space of more than 1000 feet. The first order of the three middle piles is Ionic, with encircled columns. The two adjoining pavilions are also ornamented with Ionic pillars; but fluted, and embellished with foliage from the third of their height to the summit. The second order of these two pavilions is Corinthian. The two piles of building, which come next, as well as the two pavilions of the wings, are of the Composite order, with fluted pillars. An iron palisade divides the court of the Thuilleries from the Caroufel; in this are three gateways, the two end ones of which are ornamented by the four celebrated bronze horses, supposed to have been the work of Lysippus, and which, previously to their occupying their present station, had successively ornamented the arch of Nero at Rome, the Hippodrome at Constantinople, and the church of St. Mark at Venice. The gardens of the Thuilleries are always open to the public, and are the principal promenade of this part of the town. Among the decorations of the gardens are many fine statues, bronzes, and casts. The Place de la Concorde, at the end of the gardens of the Thuilleries, between them and the Champs Elysées, is one of the finest spots in Paris. The Garde Meuble, which forms one side of the Place, is little inferior in beauty to the grand façade of the Louvre; the design of it seems indeed to have been taken from the latter building, only that in the Garde Meuble there is an arcade below the colonnade which is not the case in the Louvre; a street leading to the Boulevards divides the length

of this building. At the end of this street is seen the church of La Madeleine, begun some years ago upon a very beautiful design, but like many other fine buildings it is only half finished. Four very fine marble groups decorate the gates which lead from the gardens of the Thuilleries, and from the Champs Elysées to the Place de la Concorde. Those on each side the gates of the Thuilleries are Mercury and Fame; those to the Champs Elysées are wild horses broken by slaves.

Bridges.—Of all the bridges, says Sterne, it must be acknowledged that the grandest, the lightest, the longest, and the broadest, that ever joined land to land, is the Pont Neuf. The first stone of this bridge was laid by Henry III. in 1578, and the foundation of the piles was begun to be formed on the opposite side, when the troubles of the League forced the architect, De Cerceau, to withdraw to foreign countries. The work was not resumed till the reign of Henry IV.; it was finished in 1674. The length of the bridge is 1020 feet and its breadth 72 feet, which is sufficient to admit of five carriages passing abreast. It is formed of twelve arches, seven of which are on the side of the Louvre, and five on the side of the Quai des Augustines, extending over the two channels of the river, which is wider in this place, from their junction. In 1775 the parapets were repaired, and the foot-way lowered and narrowed. Soufflot, the architect of the Pantheon, availed himself of the opportunity to build, on the twenty half-moons which stand immediately above each pile, as many rotundas, in stone, to serve as shops. On the outside, above the arches, is a double cornice, which attracts the eye of the connoisseur in architecture, notwithstanding its mouldering state, on account of the *fleurons* in the antique style, and the heads of sylvas, dryads, and satyrs, which serve as supports to it, at the distance of two feet from each other. As the mole that forms a projection on this bridge, between the fifth and seventh arch, stands facing the Place Dauphine, which was built by Henry IV. it was chosen for erecting to him a statue, which was the first public monument of the kind that had been raised in honour of French kings. To the east of Pont Neuf the small islands in the middle of the Seine are connected to its banks by several bridges; to the west there are two; of these the first is the Pont National, formerly called the Pont Royal, from its having been built by Lewis XIV., and the expences defrayed out of the privy purse, to supply the place of one of wood, situated opposite to the Louvre, which was carried away by the ice in 1684. It is reckoned one of the most solid bridges in Paris, and, till the existence of the Pont de la Concorde, was the only one built across the river, without taking advantage of the islands. It stands on four piles, forming, with the two abutments, five elliptical arches of a handsome sweep. The span of the centre arch is seventy-two feet, that of the two adjoining sixty-six, and that of the two outer ones sixty. On each side is a raised pavement for foot passengers, in the middle there is breadth sufficient to admit of four carriages passing abreast. The north end of the Pont National faces the wing of the palace of the Thuilleries, distinguished by the name of the Pavillion de Flore. From the middle of this bridge the city is seen in a most striking point of view. Following the banks of the Seine towards the west we next come to the Pont de la Concorde, which was begun in 1787, and finished in 1790. It is 462 feet in length, by forty-eight in breadth. Like the Pont National it consists of five elliptical arches, the span of the centre arch is 96 feet, that of the collateral ones 87, and that of the two others near the abutments 68. Under one of the latter is a tracking-path for the facility of navigation.

Boulevards.—This is the name given to the promenades

with which Paris is, in part, surrounded, for an extent of more than 12,000 yards. They are distinguished by the names of the Old and New. The Old, or North Boulevards, commonly called Les Grands Boulevards, were begun in 1536, and intended to serve as fortifications against the English, who were ravaging Picardy, and threatening the capital. Hence the name Boulevard, which signifies a bulwark. The extent of the Old Boulevards is about 5000 yards: they were first planted in 1660, and are formed into three alleys by four rows of trees. The middle alley is appropriated to carriages and persons on horseback, and the two lateral ones are for foot passengers. The New Boulevards, situated to the south, were not finished till 1761: they are about 7000 yards in extent, and though laid out much in the same manner as the Old, there is little resemblance between them. Near the middle of the North Boulevards stand two edifices, which owe their erection to the vanity of Lewis XIV. In the gratification of that passion did he console himself for his numerous defeats and disappointments, and the age in which he lived being fertile in great men, his display of it was well seconded by their superior talents. Previously to his reign, Paris had several gates, some of which being taken down, arches of triumph, in imitation of those of the Romans, were erected in their stead, by Lewis the Great, in commemoration of his exploits. Such was the origin of Porte Saint Denis. The magnificence of the architecture of this building classifies it among the first public monuments in Paris. It consists of a triumphal arch, insulated in the manner of those of the ancients: it is 72 feet in diameter as well as in elevation, and was executed in the year 1672. On each side of the principal entrance rise two sculptured pyramids, charged with trophies of arms. Underneath each of the pyramids is a small collateral passage for persons on foot. The arch is ornamented with two bas reliefs: the one facing the city represents the passage of the Rhine; the other the capture of Maestricht. On arriving from Calais, you enter Paris by the Porte St. Denis; and it was by the Porte St. Denis that kings and queens made their public entry. On these occasions, the houses in all the streets through which they passed were decorated with silk hangings and tapestry, as far as the cathedral of Notre Dame. Scented waters perfumed the air in the form of jets d'eau, while wine and milk actually were made to flow from different public fountains. At a short distance from Porte St. Denis is Porte St. Martin, which was erected in 1764, as a triumphal arch, but it is not at all equal in magnificence to the other. It is pierced with three openings; the centre one is eighteen feet wide, and the two others nine. The whole structure, which is fifty-four feet both in height and breadth, is rusticated, and in the spandrels of the arch are four bas reliefs, which are crowned by an entablature of the Doric order, surmounted by an attic. The Porte St. Martin is the grand entrance into Paris from all parts of Flanders.

Public Libraries.—The most splendid of these collections has had different names according to the nature of the government. Under the kings it was the Royal Library; during the republic it was called the National Library; and it is now the Imperial Library. The building itself is very large, its length being more than 500 feet, and its breadth upwards of 120. The principal floor of the building which surrounds the large court is entirely filled with books, from the bottom to the ceiling. At the window, and in different parts of one of the wings, tables are placed for the accommodation of readers. The library is open every day from ten till two. In a small recess of one of the four sides of the library, is a group of about five feet in height,

PARIS.

and six in breadth, erected in the time of Lewis XIV. It represents Parnassus with Apollo and the Muses. There are likewise in the library some busts of celebrated French literati. This library traces its origin to a very remote era. Charles V. added about 900 volumes to a small collection left by his father John. This collection, placed in a tower of the Louvre, was called "La Tour de la Librairie," and was lighted every night by thirty small chandeliers and a silver lamp, so that students and the learned might be accommodated every hour. The library was after this dispersed; for in 1429, when Paris was in the hands of the English, under the command of the duke of Bedford, that nobleman bought the 150 volumes, of which it consisted, for 1200 livres. Lewis XI. collected the scattered remnants of this library, and profited by the resources which the invention of printing presented to him. Charles VIII. added to it what the conquests of Italy allowed him to collect. Lewis XII. enriched it with the library of Petrarch: Francis I. with Greek manuscripts; and Henry II. augmented it, in consequence of the decree of 1556, enjoining booksellers to furnish the royal libraries with a copy on vellum of every book published. Hence it became so large, that many years ago it was allowed to equal, if not to excel, every other collection extant. It is now much enriched by the spoils of Venice, Florence, and Rome. It consisted, fifteen years ago, of more than 300,000 volumes, and is divided into five departments. The first, containing the printed books, is on the first story. The second department comprises manuscripts, to the number of 80,000; of which 25,000 are in learned and foreign languages, and 30,000 on the history of France, chiefly from the reign of Lewis XI. The five great rooms on the second story contain the genealogies, and are filled with 5000 port-folios. The cabinet of medals is decorated with three large pictures, representing Thalia, Calliope, and Terpsichore. There are also three pictures representing Psyche, the inventrix of the flute, led by Hymen, and the three patrons of the Muses. The cabinet of antiques, situated on the third story, contains busts, vases, inscriptions, and instruments of sacrifices collected by the celebrated Caylus. Opposite to the entrance, various Egyptian antiquities meet the eye. At one end of the room are warlike instruments of different Indian nations. On the floor stands a large antique marble table. The walls are decorated with the shields of Scipio and Hannibal. In the middle of this cabinet of antiques is a long table, covered with Etrurian vases of superior beauty. On the third floor are two apartments, which contain Etrurian vases of extraordinary magnitude, a bathing vessel of porphyry, sacrificing knives, lamps, &c. Two rooms belonging to the library are filled with a collection of 5000 volumes of prints.

The library of the Arsenal is supposed to contain 75,000 volumes, and 6000 manuscripts. It formerly belonged to the count d'Artois, now forms part of the library at the Luxembourg, and contains many MSS. beautifully illuminated on vellum. The library of the Pantheon consists of 100,000 printed volumes, and 2000 MSS., and is decorated with different marble busts of French literati. The library of St. Victor was opened in 1652, and among its numerous MSS. is a collection of the proceedings against the celebrated Jeanne d'Arc. Besides these, all the public bodies have their respective libraries, to which access may be readily had by foreigners as well as natives.

Literary Institutions.—The National Institute is the principal of the learned societies of Paris. Its main object is to improve the arts by uninterrupted inquiries; by the examination of literary and scientific labours, and by corre-

spondence with foreign and learned societies. "It is impossible," says an American traveller, "for a foreigner and a student to be a week in the French capital, without having his imagination absolutely overpowered, and his enthusiasm wound up to the highest pitch, by the eclat which he sees attendant on science and literature, and the facilities which he finds open to him for the culture of all the branches of human knowledge. For besides the libraries, and other establishments already mentioned, all of which are accessible upon the easiest terms, there are innumerable gratuitous lectures read at the expence of government at all hours in the day: a garden of plants, and a museum of natural history, the most perfect in the arrangement, and the most ample in the materials, to be found in the world; and the branches of knowledge to which they relate are daily explained to all visitors, by men illustrious for their skill and their discoveries; public exhibitions to excite literary emulation, and national rewards to give spirit to literary industry." Of the National Institute (see INSTITUTE), his imperial majesty himself is a member, and the reputation of this learned body exceeds that of any other learned society in the world. This body is but an incorporation of the old academies of Paris, and is now divided into four distinct classes correspondent to those academies. The *first* class is that of the physical and mathematical sciences; the *second*, that of the literature of France, and of the French language; the *third*, that of history and ancient literature; and the *fourth*, that of the fine arts. The members, together with the foreign associates, amount to the number of two hundred. When a nomination is to take place, the class by which it is to be made selects two candidates, between whom the emperor makes choice. Each class has one public sitting annually; at this prizes are distributed, memoirs read, &c. The first class has a private sitting every Monday, from three o'clock until six in the evening, to which strangers are admitted when introduced by a member. The members receive an annuity from government of about fifty pounds. Most of them, however, and particularly those who belong to the first class, are invested with public employment, so as to be furnished with an easy subsistence. Upon some of them the highest honours of the state have been lavished. For some time after his accession to the government, Bonaparte found the Institute the most unmanageable of all the public associations of France. It was filled with men who had taken an active part in the revolution, and some of whom were enthusiastically devoted to the principles of freedom. His efforts to mould them to his purposes, and to render them completely subservient to the consolidation and increase of his power, were for a long time ineffectual. After employing the means of intimidation without success, he had recourse to a system of patronage and corruption, which he has found much more efficacious. The laborious *savans*, and the indigent literati, were converted into senators, counsellors of state, legislators, inspectors, and even ministers, and the majority of the whole body invested with the cross of the legion of honour. A complete victory over the Institute was of some importance to the views of Bonaparte, but of a most pernicious tendency with regard to the interests of freedom and sound literature. The subordinate classes of this body embrace, with few exceptions, those who are most deservedly eminent throughout the empire for their learning. The first class, as a scientific association, ranks higher than any other in the world. The public meetings of the National Institute are held in a very extensive and magnificent room. Both its sides are adorned by beautiful colonnades, and the ceiling is finely painted and decorated. Between the columns

lums are fourteen marble statues, highly finished, of the most celebrated persons whom France ever produced, *viz.* Conde, Tourville, Descartes, Bayard, Sully, Turenne, Daguesseau, L'Hopital, Rossuel, Duquesne, Catinat, Vauban, and Fenelon. At the ends are two sitting figures of Pascal and Rollin. In the antichamber are the statues of Moliere, Racine, Corneille, La Fontaine, and Montesquieu. The hall is extremely well lighted; the floors are covered with carpets, and tables are placed parallel to the four walls of the hall, at which the members of the Institute take their places. The president of the Institute is seated at the upper end of the hall; in the middle, and rather on one side of him, is a tribune, from whom, whatever is proposed is received by the president, who does not leave his chair. The place allotted for members is surrounded by a rail, between which and the walls there is, round the hall, a row of benches, where the spectators take their seats. Each class annually proposes two prize questions, and in these general meetings the answers are made public, and the premiums distributed. The united sections of painting, sculpture, and architecture elect the pupils, who, at the expence of the republic, are to travel to Rome, in order to study the fine arts. Twenty young men are elected by the Institute to travel in France, and in foreign countries, for the purpose of studying rural economy. Six members, also, of the Institute itself, are to travel at the public expence to collect information, and to acquire experience in the different sciences.

In the Museum of French monuments, the several subjects are distributed in different apartments; and by their arrangements they exhibit the state of statuary in France from the earliest periods to the present time. They are arranged according to their respective antiquity, each department containing specimens of a single century, which is numbered at the entrance; and receiving light through the windows of painted glass, executed during the same period. The Museum of Natural History consists of a botanic garden, of a library for natural history, of a menagerie, or collection of foreign animals, and of an amphitheatre, or lecture room. Professors deliver public lectures in rotation during the summer months.

Public Instruction.—After the suppression of the colleges and universities existing under the monarchy, the National Convention, by a decree of the 14th of January 1795, established Normal schools throughout the republic. Professors and teachers were appointed to them, and it was intended, that in these nurseries youth should be prepared for the higher schools, according to the new plan of instruction. However, in the course of a few months, these Normal schools were shut up, and primary, secondary, and central schools, were ordered to be established in every department. In the primary schools, reading, writing, and arithmetic formed the chief part of the instruction. Owing to various causes, the secondary schools were not established. In the central schools, the whole of the instruction was divided into three classes or sections. In the first are taught drawing, natural history, and ancient and modern languages. In the second, mathematics, physics, and chemistry. In the third, universal grammar, the fine arts, history, and legislation. In the first class, the pupils were to be received at the age of twelve; into the second, at fourteen; and into the third at sixteen. To each central school are attached a library, a botanic garden, and an apparatus for chemistry and experimental philosophy. The professors are examined and chosen by a jury of instruction, and that choice confirmed by the administration of the department. Besides these, there are special schools, in which are taught the useful

sciences, jurisprudence, medicine, and natural history. There are likewise schools appropriated to different professions, solely devoted to the public service, and which require particular knowledge in the arts and sciences. Hence they bear the name of "Schools for public Services." In order to be admitted into any of these schools, the candidates must prove themselves qualified by the preliminary instruction required in the examinations at the competition prescribed for each of them. The pupils of these schools receive a salary from the nation. At the head of them is the *Polytechnic School*, which is the grand nursery whence the pupils, after they have attained a sufficient degree of perfection, are transplanted into the other schools for public services. Next come the *Schools of Artillery*, of which there are eight in the places where the regiments of artillery are garrisoned. The pupils who are sent thither as officers, after having been examined, apply their knowledge to the arts; to the construction of works; and to the manœuvres of war dependent on artillery. Each school, in which the pupils must remain two years longer, is under the superintendance of a general of brigade of the corps. The school of military engineers, united to that of miners, is established at Metz. Its labours relate to the application of the theoretical knowledge which the pupils have imbibed at the Polytechnic school. The object of these labours is the construction of all sorts of works of fortification, mines and countermines, mock representations of sieges, attack and defence, the drawing of plans and military surveys, and all the details of the duty of engineers in fortified places, and in the field. The number of pupils is limited to twenty: they have the rank and pay of second lieutenants. They undergo a strict examination respecting the objects of instruction, which examination is entrusted to a jury, composed of the commander-in-chief of the school, a general or field officer of the corps, appointed every year by the minister at war, and one of the permanent examiners of the Polytechnic school. This jury forms the list of merit which regulates the order of promotion. The school of bridges and highways was founded, in 1787, by Trudaine, and continued under the direction of Perronet, chief engineer of the corps, till his death, in 1794. By his will he bequeathed to this school, for the instruction of the pupils, his library, his models, his manuscripts, and his port-folios. This school unites the dépôt, or repository of plans and models, canals and harbours, for trade. The number of pupils is fifty. They are taken from the Polytechnic school, and retain the salary which they received there. The instruction given to them chiefly consists in the application of the principles of physics and mathematics to the art of planning, and constructing works relative to roads, canals, and sea-ports, and the buildings belonging thereto; the means of execution; and the mode of forming plans and estimates of the works to be executed, and the order to be observed in keeping the accounts. The practical schools of mines are established, one at Geislautern, in the department of La Serre, and the other at Pefay, in the department of Mont Blanc. The director and professors form a committee for the working of the mines of Pefay, as well as for the instruction of the pupils. In consequence of the report of this committee, the council of mines, established at Paris, proposes to the government the measures necessary to be adopted. Twenty pupils, who have passed their examination at the Polytechnic school, are attached to the practical schools for the purpose of applying the theoretical part of their instruction. The school of Naval Engineers is for pupils who have been students, at least two years, in the Polytechnic school. The examination of the candidates takes place every year,

and the preference is given to those who excel in descriptive geometry, mechanics, and the other branches of knowledge appropriated to the first year's study at school. When the pupils have proved, in the repeated examinations which they must undergo, that they are sufficiently qualified, they are then sent to Brest, in order to apply the theory they have acquired to the different works carried on in that port, where they find both the example and the precept, and are taught every thing relative to the construction of ships of war and merchant vessels. The pupils admitted into it receive a salary of 1800 francs, or about 75*l.* *per annum.* The schools of mathematics and hydrography, established for the navy of the state, and the schools of hydrography destined for the merchant-service, bear the name of Schools of Navigation. Every year there is a competition for the admission of candidates for naval employment. The hydrographical examiner makes a general tour to the different ports, where he interrogates the pupils in arithmetic, algebra, geometry, statics, and navigation. According as they prove themselves worthy by their examinations, they are admitted to the rank of *aspirans de marine*, or midshipmen; captains of merchants'-ships for long voyages; masters of coasting vessels; pilots, &c. Besides these, there are special schools of painting and sculpture; of architecture, music, &c.

Hospitals and other charitable Institutions.—The civil hospitals in Paris form two distinct classes: the one comprehends the hospitals of the sick; the other, those for the indigent: the former are devoted to the relief of the afflicted, the latter serve as an asylum to children, to the infirm, and to the aged indigent. All persons who are not ill enough to be admitted of necessity into the hospital nearest to their residence, are obliged to present themselves to the Bureau Central d'Admissions. Here they are examined, and if there be occasion, they receive a ticket of admission for the hospital where their particular disorder is treated. At the head of the hospitals for the sick stands the Hôtel-Dieu. Formerly this was rather a charnel-house than an hospital. It was founded, as far back as the year 660, for the reception of the sick and maimed of both sexes, without any exception of persons. All of every country, and of every religion, were admitted without form or recommendation. Though it contained but 1200 beds, the number of patients very often exceeded 5000, and on the average it was never less than 2500. Till the year 1786, no steps were taken for enlarging the hospital, or providing elsewhere for those who could not be conveniently accommodated in it. The air of the neighbourhood was contaminated by the noisome exhalations continually arising from this abode of pestilence, and that which was breathed within the walls of the hospital was so contagious, as to turn a trifling complaint into a dangerous disorder, and a simple wound into a mortification. In 1785, the attention of the government being called to this serious evil by various memoirs, the Academy of Sciences was directed to investigate the truth of the bold assertions made in different publications. A report was made, and the hospital enlarged, so as to contain 2000 beds. Since the revolution, the improvements introduced into the interior government of the Hôtel-Dieu have been great and rapid. Each patient now has a bed to himself. Those attacked by contagious disorders are transferred to the Hospice St. Louis. Insane persons are no longer admitted; men, thus afflicted, are sent to a special hospital established at Charenton, and the women to Salpêtrière. At the Hôtel-Dieu every method has been put in practice to promote the circulation of air, and expel the noxious miasmata. In all the French hospitals, one ward, at least, is now

always kept empty. The moment it becomes so by the removal of the patients into another, the walls are lime-whitened, and the air is purified by the fumigation with some of the mineral acids, according to the plan first proposed by Guyton-Morveau. This operation is thus alternately performed in each ward in succession; that which has been the longest occupied being purified the first, and left empty till it is wanted. The number of hospitals in Paris has of late years been considerably augmented. They are all supported by government, and not, like those in England, by private benefactions. Sick children of both sexes are no longer admitted promiscuously into different hospitals; but are received into a special hospital, extremely well arranged, and in a fine airy situation beyond the Barrière des Sevres. Two institutions have been formed for the aged, infirm, and indigent, who pay on entrance a moderate sum. An hospital for gratuitous vaccination is open for the continual treatment of the cow-pox, and the distribution of the matter to all parts of France. In general, the charitable institutions in Paris have, within the last twenty years, undergone very considerable improvements. The male orphans admitted, to the number of two thousand, into the asylum formerly called La Pitie, used to remain idle, or employed only to follow in funeral processions, but are now kept at work, and are instructed in some useful trade. A new institution for female orphans has also been established. The palace of the Hospital des Enfants-Trouvés is supplied by an establishment on a large scale, called the Hospice de la Maternité, which is divided into two branches, each of which occupies a separate house. The one for foundlings, in the rue de la Bourbe, is intended for the reception of children abandoned by their parents. Here they are reared, if not sent into the country to be suckled. The other, in the rue d'Enfer, which may be regarded as the General Lying-in Hospital of Paris, is destined for the reception of pregnant women. From 1500 to 2000 are here delivered every year. No formality is required for the admission of new-born infants.

Marriages and Funerals.—The civil act of marriage is entered into at the office of the municipality. But this is not to be confounded with the contract drawn up by the notary, and containing the stipulations, clauses, and conditions. The former signifies merely that such a man and such a woman take each other for man and wife. There are but few, if any persons married, who do not repair from the municipality to the parish church, or go thither the next morning; the civil act being considered by individuals only as the ceremony of the betrothing; and till the priest has given the nuptial benediction, the relations take care, that the intended bride and bridegroom shall have no opportunity of anticipating the duties of marriage. At the church mass is said in a low voice, during which the priest, or rector, receives the promise of the wedded pair. With little exception the ceremony is the same for all. Those who pay well are married at the high altar; the rector addresses to them a speech, in which he exhorts them to live happily together; the beadles perform their duty, and the organist strikes up a voluntary. With regard to funerals, it depends on the relations to have the corpse presented at the parish-church; but there are many persons who dispense with this ceremony. The priest receives the corpse at the door of the church. It is carried thither in a *corbillard*. Each municipality has its own, and there are twelve municipalities in Paris. Some of them have adopted the Egyptian style, some the Greek, and others the Roman, for the fashion of their *corbillard*, according to the taste of the municipality which ordered its construction. It is drawn by two horses abreast, caparisoned somewhat

PARIS.

somewhat like those of our hearfes. An officer of the police, clothed in black, and holding a cane with an ivory head, walks before the corbillard or hearfe. Each corpse has its particular coffin furnished by the municipality. The relations follow on foot, or in carriages: few of them are in mourning, and still fewer wear a cloak. Before the revolution, the church-yards in Paris were not numerous, the burials being often in the churches themselves. That of the Innocents was the largest and most remarkable, a predilection for its presumed holiness having been adopted by the devout. Since the law ordaining that the dead should not be buried in churches, nor even in the city, only two church-yards are open for this populous capital. One serves for the southern half of the city, including Hôtel Dieu: the other, for the northern half, is in a small irregular vale, on the southern declivity of Mont Martre. The latter repository is not only in a picturesque situation, but variegated by the unevenness of the ground; it is surrounded by a wall of moulded clay, capped with flat tiles, to protect it from the weather, and supported by so many buttresses, that a stone wall would probably have been cheaper. On entering this place you see to the left a sandy elevation of the natural soil, declining towards the west. The coffin is let down on the edge of this declivity to a shelf at a small depth, and covered with a few shovels-full of sand. If the body come from an hospital, it is only enclosed in a sack, and borne by two men on a hand bier, over which two half hoops support a linen cloth. The rapidity with which burials are hastened deserves the severest reprobation, the bodies being kept at no time 24 hours, so that the death can scarcely be ascertained: the bodies are, however, exposed in the gateway of the hotel, with tapers and holy water, which is sprinkled over the coffin by devout visitants. Towards the right, or eastern part of Mont Martre, there is a little vale, planted with weeping willows and shrubs interspersed with tombs of stone. This part is reserved for those of a superior class: the epitaphs are elegant and concise.

Government and Police.—Of the several officers at the head of the government in Paris, one is denominated the *minister of justice*, who is charged with the printing and distribution of the laws, proclamations, and orders of the government; he corresponds with the various tribunals, and their commissaries; he submits to the councils of state the new questions which may arise relating to the administration of justice, and superintends its administration. The *minister of the home department* corresponds with the prefects of the departments. All acts relative to prisons, hospitals, roads, bridges, public works, canals, commerce, industry, agriculture, manufactures, arts, inventions, public schools, museums, and national festivals, are under his immediate direction. What particularly regards the government of the city of Paris is the department of the police, of which the minister or director, for it matters not the name he is called by, has a most arduous task. "He has not," says a close observer, "a moment that he can call his own; he is every day obliged to punish; he is afraid to give way to indulgence, because he does not know that he may not one day have to reproach himself with it. He is under the necessity of being severe, and of acting contrary to the inclination of his heart. Not a crime is committed, but he receives an exaggerated account of it. Not an accident happens but he must prescribe the remedy; he has but a moment to deliberate and act, and he must be equally fearful to abuse the power intrusted to him, and not to use it opportunely. Popular rumours, slighty conversations, theatrical factions, false alarms, every thing concerns him. He must be answerable for every thing; he must trace the robber, and the assassin,

for the magistrate appears blameable, if he has not found means to deliver him up quickly to justice. The time that his agents have employed in this capture will be calculated, and his honour requires that the interval between the crime and the imprisonment should be the shortest possible. What dreadful duties! What a laborious life! He must daily make up for the imperfection and tardiness of the civil laws, but he must, at the same time, use this rare privilege with extreme circumspection. The chief of the police is become a minister of importance; he has a secret and prodigious influence; he knows so many things, that he can do much good, or create a deal of mischief, because he has in his hand a multitude of threads, which he can entangle or disentangle at his pleasure; he strikes or he saves, he spreads darkness or light; his authority is as delicate as it is extensive. He exercises a despotic sway over the *mouchards*, or *spies*, who are found disobedient, or who make false reports; as for these wretches, they are of a class so vile, that the authority to which they have sold themselves, has necessarily an absolute right over their persons. This is not the case with those who are apprehended in the name of the police; they may have committed trifling faults, but are frequently detained without the sanction of any law. A few real advantages compensate for the irregular forms to which every one is subject, and, as an excuse for the arbitrary imprisonment of individuals, it is said 'there are an infinite number of irregularities which the slow and grave process of the tribunals can neither take cognizance of, nor put a stop to, nor foresee, nor punish. The audacious or subtle delinquent would triumph in the winding labyrinth of our civil laws. The laws of the police, more direct, watch him, press him, and surround him more closely. The abuse is contiguous to the benefit, I admit, but a great many private acts of violence, base and shameful crimes, are repressed by this vigilant and active force, which ought, nevertheless, to publish its code, and submit it to the inspection of enlightened citizens.' Could the minister of police communicate to the philosopher all he knows, all he learns, all he sees, and likewise impart to him certain secret things, of which he alone is well informed, there could be nothing so curious, and so instructive, under the pen of the philosopher. But this magistrate is like the great penitentiary; he hears every thing, relates nothing, and is not astonished at certain delinquencies in the same degree as another man. He is in a perpetual state of mistrust; and in the main he ought to possess such a character; for he ought to think nothing impossible, after the extraordinary lessons which he receives from men and things. The spies of the police are a regiment of inquisitive fellows, with this difference, that each individual belonging to it has a distinct dress, which he changes frequently every day, and nothing so quick, or so astonishing as these sorts of metamorphoses. The same spy who figures as a private gentleman in the morning, in the evening represents a priest; at one time he is a peaceable limb of the law; at another a swaggering bully. The next day, with a gold-headed cane in his hand, he will assume the department of a married man buried in calculations: the most singular disguises are familiar to him. In the course of twenty-four hours he is an officer of distinction, and a journeyman hair-dresser; a shorn apostle and a scullion. He visits the dress-ball, and the lowest sink of vice. At one time with a diamond ring on his finger, at another with the most filthy wig on his head; he almost changes his countenance as he does his apparel; he is all eyes, all ears, all legs; for he trots over the pavement of every quarter of the town. Sometimes, in the corner of a coffee-room, you would take him for a dull, stupid, tiresome fellow, snoring till supper

is ready; he has, however, seen and heard all that has passed. At another time he is an orator, and the first to make a bold speech; he courts you to open your mind; he interprets even your silence; and whether you speak to him or not, he knows what you think on any particular proceeding. Such was the universal instrument employed in the reign of Lewis XVI. for diving into secrets; and such unquestionably is the system now carried on for the same purpose. There may be variations in the manner, as there must be different characters to perform their parts, but the police is, at least, as strict as it ever was in the reigns of the most arbitrary monarchs, and the means pursued for the purpose as hostile to the rights and liberty of the subject."

PARIS, *Department of*, one of the new divisions of France, including the city of Paris and its immediate environs.

PARIS, a town of Prussia, in the province of Bartenland; eight miles N.N.E. of Raftenburg.

PARIS, a thriving post-town of America, in the state of New York, and county of Oneida, incorporated in 1792, and containing, in 1800, 4721 inhabitants. Iron ore is found in its vicinity, and the land is excellent. It has an academy and a parish church, and its progressive improvements are rapid.—Also, the county town of Bourbon county, in Kentucky; 18 miles N.E. of Lexington. It has a court-house and gaol, a Presbyterian church, and several mills in its vicinity. Its houses are principally constructed of brick and stone. The town is pleasant and thriving, and contains 377 inhabitants.—Also, a town of London county, Virginia; 59 miles from Washington.—Also, a town in Cumberland county, and state of Maine; containing 844 inhabitants.—Also, an island on the coast of South Carolina.

PARIS, in *Botany*, a name of very obscure etymology. Professor Martyn leaves it unexplained, as Tournefort and Linnæus had done before him, all of them either overlooking, or being dissatisfied with, the explanation of Ambrosinus, who, in his *Phytologia* 506, derives it "*a paritate foliorum*," from the uniformity or equality of the four leaves, which make, as it were, two pair, equally situated. Linn. Gen. 198. Schreb. 266. Willd. Sp. Pl. v. 2. 471. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 431. Ait. Hort. Kew. ed. 2. v. 2. 425. Juss. 42. Lamarck Illustr. t. 319. Gertr. t. 83. Class and order, *Oxandria Tetragynia*. Nat. Ord. *Sarmentaceæ*, Linn. *Asparagi*, Juss.

Gen. Ch. *Cal.* Perianth inferior, permanent, of four lanceolate, acute, spreading leaves, the length of the corolla. *Cor.* Petals four, spreading, awl-shaped, equal, permanent, similar to the calyx but narrower, and alternate with it. *Stam.* Filaments eight, awl-shaped, short below the anthers, which are long, united to the middle part of the filaments. *Pist.* Germen superior, roundish, with four blunt angles; styles four, spreading, shorter than the stamens; stigmas downy. *Peric.* Berry nearly globose, with four blunt angles, somewhat depressed, of four cells. *Seeds* several, globose, inserted in two rows, upon a central receptacle.

Eff. Ch. Calyx of four leaves. Petals four, narrower than the calyx. Berry superior, of four cells. Anthers united to the middle of the filaments.

1. *P. quadrifolia*. Common Herb Paris. Linn. Sp. Pl. 526. Encl. Bot. t. 7. Fl. Dan. t. 139. Redout. Liliac. t. 226. Bulliard t. 119. (Herba Paris; Ger. em. 405. Camer. Epit. 835. Matth. Valgr. v. 2. 439).—Leaves ovate, about four.—This singular plant, found in shady woods, chiefly in the northern or cooler countries of Europe, but not very commonly in any, has always attracted the notice of botanists, from the peculiarity of its habit. It flowers in May, and the berry is ripe in July. The root is perennial, creeping. Stem solitary, erect, a foot high, per-

fectly simple, round, smooth, naked, except at the very summit, where it bears a whorl of four spreading, nearly equal, ovate, broad, acute, entire, three-ribbed, veiny, smooth leaves, tapering at the base, of a dull green hue, and pliant texture, each of them about three inches long, increasing in size as the fruit ripens, after which the whole plant soon turns of a pale yellow and withers. Flower solitary, terminal, central, on an upright angular stalk, about half as long as the leaves. Calyx-leaves ribbed, of a lighter green than the foliage, each an inch long. Petals of the same colour and length, but much narrower. Stamens half the length of the calyx, ascending, green, with yellow anthers. Styles pale, downy. Berry purple. The leaves occasionally vary in number to three or five, Haller mentions six. Linnæus says the roots are emetic, but only half as powerful as *Ipecacuanha*.

2. *P. polyphylla*. Many-leaved Herb Paris.—Leaves lanceolate, eight or ten. Discovered by Dr. F. Buchanan, growing in woods near rivulets, in Upper Nepaul, where it is known by the name of *Dai Swa*. The root is creeping, but much thicker and more tuberous than the former. Stem a foot or more in height, brownish, thrice the thickness of the first species, crowned like that with a whorl of leaves, in a similar spreading position, but about twice as numerous, and much narrower, being elliptic-lanceolate, taper-pointed, triple-ribbed; each supported on a short purplish stalk. Flower-stalk much shorter than the former, but the flower is larger, of the same green colour. Its calyx-leaves and petals are usually five, with ten stamens, but sometimes only four, with eight stamens, or even three with six. The styles, as well as the cells of the germen, always agree in number with the petals, but the former are combined by a thick columnar base, which character, added to his not having seen the ripe fruit, caused Dr. Buchanan to doubt of the genus. The habit, and rest of the characters, however, leave no scruple in our mind; but it is very possible that what Linnæus, in the European species, calls styles, may be almost wholly stigmas, for they are downy all along their upper side, and the Nepaul plant will then be found to differ merely in having the style more elongated.

PARIS, *Herb, of Canada*. See TRILLIUM.

PARISCATTY, in *Geography*, a town of Hindooostan, in Oude; 25 miles E. of Goorachpour.

PARISH, the precinct, or territory, of a parochial church; or the circuit of ground within which the people belonging to any church, or under the care of one parson or vicar, do inhabit.

The word comes from the Latin *parochia*, of the Greek *παροικια*, habitation; compounded of *παρεα*, near, and *οικος*, house. Accordingly, Du-Cange observes, that the name *παροικια* was anciently given to the whole territory of a bishop, and derives it from neighbourhood; because the primitive Christians, not daring to assemble openly in cities, were forced to meet secretly in neighbouring houses.

In the ancient church, there was one large edifice in each city, for the people to meet in; and this they called *parochia*, parish. But the signification of the word was afterwards enlarged, and by parish was meant a diocese, or the extent of the jurisdiction of a bishop, consisting of several churches; unless we will suppose, as some do, that those bishops were only pastors of single churches.

Du Pin observes, that country parishes had not their origin before the fourth century; but that those of cities are more ancient. The city of Alexandria is said to have been the first that was divided into parishes. Baronius says, that in the time of pope Cornelius there were forty-six parishes in Rome.

How ancient the division of parishes is it is not easy to ascertain; for in the early ages of Christianity in this island parishes were unknown, or at least signified the same that a diocese does now. There was then no appropriation of ecclesiastical dues to any particular church; but every man was at liberty to contribute his tithes to whatever priest or church he pleased, provided only that he did it to some; or if he made no special appropriation thereof, they were paid into the hands of the bishop, whose duty it was to distribute them among the clergy, and for other pious purposes, according to his own discretion. (Seld of Tithes, 9. 4. 2 Inst. 646. Hob. 296.) Camden says England was divided into parishes by archbishop Honorius, about the year 630 or 636. Sir Henry Hobart maintains that parishes were first erected by the council of Lateran, held A. D. 1179. But Mr. Selden has shewn, that the clergy lived in common without any division of parishes, long after the time mentioned by Camden; and it appears from the Saxon laws, that parishes were in being long before the council of Lateran, in 1179. The distinction of parishes occurs in the laws of king Edgar, about the year 970. It seems pretty clear and certain, says judge Blackstone, (Com. vol. i. 113.) that the boundaries of parishes were originally ascertained by those of a manor or manors; because it very seldom happens, that a manor extends itself over more parishes than one, though there are often many manors in one parish. The lords, he adds, as Christianity spread itself, began to build churches upon their own demesnes or wastes, to accommodate their tenants in one or two adjoining lordships; and in order to have divine service regularly performed therein, obliged all their tenants to appropriate their tithes to the maintenance of the one officiating minister, instead of leaving them at liberty to distribute them among the clergy of the diocese in general; and this tract of land, the tithes of which were so appropriated, formed a distinct parish; and this will account for the frequent intermixture of parishes one with another. For if a lord had a parcel of land detached from the main of his estate, but not sufficient to form a parish of itself, it was natural for him to endow his newly-erected church with the tithes of such lands.

Extra-parochial wastes and marsh lands, when improved and drained, are by 17 Geo. II. cap. 37. to be assessed to all parochial rates in the parish next adjoining. For settling the bounds of parishes, see PERAMBULATION.

Camden reckons 9284 parishes in England. In a book made out by cardinal Wolsey in 1520 are reckoned 9407 parish churches. And Chamberlayne makes at present, 9913, and the number of parishes is now reckoned to be about 10,000. See CHURCH of England.

PARISH-PRIEST, the parson or minister who holds a parish as a benefice.

If the predial tithes be appropriated, the parson is called *rector*. If they be impropriated, he is called *vicar*.

PARISH-CLERK. In every parish the parson, vicar, &c. hath a parish-clerk under him, who is the lowest officer of the church. These were formerly clerks in orders, and their business at first was to officiate at the altar; for which they had a competent maintenance by offerings; but now they are laymen, and have certain fees with the parson on christenings, marriages, burials, &c. besides wages for their maintenance.

The law looks upon them as officers for life: and they are chosen by the minister of the parish, unless there is a custom for the parishioners or churchwardens to choose them; in which case the canon cannot abrogate such custom; and when chosen it is to be signified, and they are to be sworn

into their office by the archdeacon, for which the court of king's bench will grant a mandamus.

Parish clerks, after having been duly chosen and appointed, are usually licensed by the ordinary, and when they are licensed, they are sworn to obey the minister. The parish-clerk ought to be deprived by him that placed him in his office; and if he is unjustly deprived, a mandamus will lie to the church-wardens to restore him: for the law looks upon him as an officer for life, and one that hath a freehold in his place, and not as a servant: and therefore will not suffer the ecclesiastical court to deprive him, but only to correct him, for any misdemeanour, by ecclesiastical censures. 3 Roll's Abr. 234. Gibf. 214. God. 192.

PARISH-CLERKS, *Company of*. See COMPANY.

PARISI, in *Ancient Geography*, inhabitants of Britain, seated to the north of the Coritani, and occupying that district which is called Holderness, or as Mr. Camden imagines, the whole east riding of Yorkshire. The Parisi are supposed to have derived their name from the two British words "Paur Isa," which signify low pasture, and which are descriptive of the situation and use of their country. However this may be, it is evident that our Parisi never attained to any great degree of power or consequence, but were always subject to the authority, and followed the fate of their more powerful neighbours, the Brigantes. Their only town was "Pituaria," probably Patrington in Holderness.

PARISIAN ISLAND, in *Geography*, an island in lake Superior, near the S.E. coast. N. lat. 46° 30'. W. long. 85°.

PARISIS, a French money of account, formerly a real coin struck at Paris, at the same time with the Tournois, struck at Tours.

The Parisi exceeded the Tournois by one-fourth; so that the livre, or pound Parisi, was twenty-five sels; and the livre Tournois twenty. The sels and deniers Parisi, &c. were in proportion. See COIN.

PARISOT, in *Geography*, a town of France, in the department of the Aveyron; 10 miles S.W. of Villefranche.

PARISTHMIOTOMUS, from *παρισθμια*, the *tonfils*, and *τεμνω*, to cut, in *Surgery*, an instrument anciently employed for scarifying the tonsils.

PARITA, in *Geography*, a town of South America, in the province of Panama; 5 miles N. of Santos.

PARITEE-HOTUN, a town of Chinese Tartary. N. lat. 42° 28'. E. long 125° 16'.

PARIUM, in *Ancient Geography*, CAMANAR, a town situated in the Propontide, between Lampacus and Priapus. Its territory was fertile, and produced excellent wines, and it had a good port. This town was founded by the Milesians, the Erythræans, and the inhabitants of the isle of Paros, from which it took its name. Augustus established a colony in this place, and, like many others, it was governed by a senate or council composed of decurions. The worship of Apollo and Diana was transported from Adrastia to Parium, where a large and splendid altar was erected, the work of the celebrated Hermocreon. Strabo. Pliny also mentions a statue of Cupidon, belonging to this city, the production of Praxiteles, and not inferior in beauty to the Venus of Cnidus. Parium was ravaged in the year 267 by the Heruli, a German nation; but these barbarians were defeated and driven into their own country by the emperor Gallienus, in consequence of which a triumphal arch was erected; which arch consisted of three arcades, upon which the emperor appeared in a car drawn by two elephants, between two victories, which presented to him a crown

of laurel. When the government of proconsular Asia was divided into several provinces, Parium was comprised in the new province of the Hellespont, of which Cyzicus was the metropolis.

PARIVOA, in *Botany*, a name in Aublet, v. 2. 756, for one of those genera on which Schreber founded his DIMORPHIA; see that article, as well as PANZERA. As we have, after Willdenow's example, separated the latter, the *Parivoa* must remain under the denomination of *Dimorpha*, which however, by this division, loses its original meaning.

PARIYATEKA, is the Sanscrit name of a species of *nyctanthes*, and in the mythological legends of the Hindoos is a golden tree, yielding in its fruit whatever the heart can desire. It is fabled to have arisen from the ocean when churned by the gods and demons, as described under the article KURMAVATARA, and to have fallen to the lot of the demigod Indra, regent of the firmament, who hence, and from similar possessions, is called the lord of wealth. (See INDRA.) The name is commonly pronounced *parijat*, and it is often alluded to in the holy tales and fables of the Hindoos. Sometimes it is called *Lakshmi-vriksha*, the tree of Lakshmi, or wealth. This is a treatise on Hindoo music in the Persian language, probably a translation from the Sanscrit, named after this all-yielding tree *Pariyateka*.

PARK, PARCUS, a large inclosure, privileged for wild beasts of chase, either by the king's grant, or by prescription. Co. Litt. 233. 2 Inst. 159. 11 Rep. 36.

The word is originally Celtic; where it signifies an inclosure, or place shut up with walls.

Manwood defines a park a place of privilege for beasts of venery, or hunt, and other wild beasts of the forest, and of chase; *tam sylvestres, quam campestris*. A park differs from a forest, in that, as Compton observes, a subject may hold a park by prescription, or the king's grant; which he cannot with respect to a forest.

A park differs from a chase also; because a park must be inclosed; if it lie open, it is a good cause of seizing it into the king's hand, as a free chase may be, if it be inclosed. Nor can the owner have any action against such as hunt in his park if it lie open. See CHASE.

Du-Cange refers the invention of parks to king Henry I. of England, and the first park in England is said to have been that of Woodstock in Oxfordshire, made by him, which was walled round with stone, and seven miles in circumference: the royal example was first followed by Henry, earl of Warwick, to preserve his deer and other animals for hunting; after which the practice of park-making became general among persons of opulence. But Spelman shews it is much more ancient; and was in use among the Anglo-Saxons. Zosimus assures us also, that the ancient kings of Persia had parks.

The clergy of rank, at all times, had the privilege of hunting in their own parks and inclosures; and therefore, that they might not be prevented from following this favourite pastime, they took care to have such receptacles for game belonging to their parks. Accordingly, at the time of the Reformation, the see of Norwich, only, was in the possession of not less than thirteen parks, well stocked with deer and other animals for the chase.

No man can now erect a park without a license under the broad seal; for the common law does not encourage matters of pleasure, which bring no profit to the commonwealth. Wood's Inst. 207.

But there may be a park in reputation, erected without lawful warrant; and the owner of such park may bring his action against persons killing his deer. Ibid.

To a park three things are required. 1. A grant thereof.

2. Inclosures by pale, wall, or hedge. 3. Beasts of a park, such as buck, doe, &c. and where all the deer are destroyed, it shall no more be accounted a park, for a park consists of vert, venison, and inclosure; and if it is determined in any of them, it is a total disparking; and the king may by letters patent dissolve his park. Cro. Car. 59, 60.

Parks as well as chases are subject to the common law, and are not to be governed by the forest laws. 4 Inst. 314.

Offenders pulling down park-walls or pales, shall be liable to the same penalty as for killing deer, &c. by statute. See DEER-stealers.

A park ought to have three sorts of ground in it: 1. Mountainous and barren. 2. Hilly and yet fertile. And 3. Plains that are sufficiently fruitful. The mountainous part should be well covered with high woods over at least a third part of it. The downs and hilly part should have one-third part coppices and low woods; and the plains should be at least one-third part pasture ground, with some arable or corn land. There should be a river contrived to run through some part of it, and a spring or brook to go through a great part, and at length fall into the river.

These are the natural advantages to be wished in a park; but when they are wanting, they are to be supplied as far as may be by art, as by ponds to preserve rain water, to supply the place of rivers and springs, and proper plantations and exposures for the rest; only the person who is to make a park should know what the natural advantages are, that he may take in as many as he can. When ponds are to be made to supply the place of natural brooks and rivers, they should be made large enough: the extraordinary expence in this will be easily repaid, by breeding fish in them, and fowl may also be kept in plenty on them. The park should also be well stored with trees; oaks should not be wanting in it, but beech and chestnut are the quickest of growth, and are easy to be had: these, therefore, should be planted in considerable numbers. Apple-trees and plum-trees also should be planted, as generally thriving very well, and affording good food to the deer, &c.

The best inclosure for a park is a brick or stone wall; but as the expence of this is very great, it may be done by paling; the pales must, in this case, be of sound heart of oak; and so close planted, that no animal of prey can make its way in between them; and for a farther defence, a good quick-set hedge is very proper, and should be kept in good order. Some part of the mountain and high wood may conveniently be made a heronry, and some part of the middle may be a warren for hares and rabbits. Colts and horses may be bred at large in the park, and in the summer season it will be proper to have cows in the pasture-ground on the plains.

There should be at least five or six inclosures in the park, that the deer may be shut out or let in as occasion requires. In the coldest seasons, they should always be kept altogether in the high woods, where they have good shelter, and are to be fed constantly with provender by the keepers. In the summer such a number as are intended to be used may also be kept on the best ground, that they may thrive quicker than those intended only for store. Some artificial holes and caverns should also be made for the deer to retire into in the hot weather, as well as in the cold.

PARK, in *Gardening*, an inclosed piece or portion of ground, of a larger or smaller extent, which surrounds a mansion or residence, and which has commonly some sort of forest or other trees, planted or growing on it, for the purpose of beauty or ornament. Large parks mostly contain deer or other similar animals, and the more they have of this
wild

wild or forest scenery, the more natural and proper they appear.

It is supposed by Mr. Loudon, in his "Treatise on Country Residences," that parks should be of two kinds; those belonging to small houses, where regard should principally be had to the value of the pasture, and where the pasturing animals are horses, cattle, sheep, &c.; and those where grandeur of character is the main object.

In the former sort, the surface of the ground should be unbroken, but clothed and varied, or characterized chiefly by trees, unless a few shrubs of the lower growths be admitted near the residences, or the walks of the pleasure or more ornamental parts. The apparent extent of this kind of parks depends more upon the variety of the grounds, and the manner in which the trees and shrubs are planted, than upon the number of acres. A level or uniform surface, spotted by circular, oval, or even angular clumps, and surrounded by a compact serpentine belt, as at Duddington, and some other places, can never, it is supposed, appear extensive; but a very few acres of varied ground, sprinkled over with light groups, thorns, and hollies, appear boundless. In such a park, every step presents a new composition, arising from the varied herds of cattle intermingling with the trees, &c. and always changing their position: and as there is no permanent mark by which one scene can be distinguished from another, so as to know it again; a person might wander up and down the extent of a few acres for several days, without being able to say whether he was not traversing a park of several square miles. And this is the case in natural forests, as depending on the same principles.

In the latter kind of parks, nothing, it is believed, can contribute so highly to the necessary grandeur of effect, as the *wild, forest* style, of breaking the ground, and planting trees, shrubs, low growths of plants, furze, bramble, ferns, &c.; and shewing roots, decayed trunks, rocks, or stones, when they may appear with propriety, and as it were fortuitously. The grazing animals in this case should be principally deer, a few wild cattle, and horses. It is suggested, that as parks are the prominent features of all extensive residences, were this appearance of wildness and forest scenery given to them, words could not convey an adequate idea of the beauty and grandeur that would be communicated to them, and at the same time to the country at large. The materials by which this is chiefly to be effected are, as has been seen, the proper arrangement of *low scrubby growths, wild plants, and forest trees*. Nothing can however give an idea of what these effects might be, except looking at the finest ranges of forest scenery, few of which now exist in the country. In the New Forest, as well as that of Needwood, it is however supposed, that there are still select ranges or tracts, which the true admirers of nature will view with rapture or enthusiastic delight, and by the imitation of which, vast ornamental advantages might be made to the already beautiful parks of Donnington, Blenheim, and Croom, as well as all those esteemed the finest in the kingdom.

Some may suppose the utility of such parks thus to be injured. And so it would in some degree; but it is asked, is not beauty or grandeur of character one of the chief objects of such scenes? if not, why change the common character of the country, why make the interesting variety of corn-fields, farms, cottages, hedges, coppices, &c. give way to one dull rapid monotonous surface of green, as insipidly varied by trees; where one might wander an age without seeing any thing else than their naked stems and clump-like heads? Nothing, it is believed, can be grand or sublime, but as it soars above the common appearances of the like things. Now, says the writer, in a fertile and cultivated country,

what can be more truly uncommon with regard to the surface, than making it assume the wild irregularity and excesses of nature, leaving flocks and herds to roam at pleasure, and despising the teeming abundance of cultivation, and the grosser ideas of mere profit or use?

It is not, however, meant by this to affirm, that there would be much real difference in the annual profit of a park so laid out, when compared with one in the modern taste. What was not occupied with pasture would be covered with wood; which, whether as undergrowth, or timber produce, would be highly valuable, and often produces as much profit as either pasture or aration, and in many scenes is highly suitable for parks: besides the abundance of every kind of game which this would produce, as well as the encouragement it would give to different classes of beautiful singing-birds. It is added, that this being the case, and it being taken into view that deer are not grazed for pecuniary advantage, it cannot be seen that there would be any real disadvantage in point of profit by adopting the mode; and hence it is wished that it should in some degree be attended to, even in parks of the smallest size, where cattle and sheep are grazed. And it is farther suggested, that in this age of refinement and universal cultivation, wildness and native simplicity have charms which are highly interesting to all, except those engaged in the vortex of fashion.

PARK is also used for a moveable pallisade, set up in the fields to inclose sheep in to feed, and rest in, during the night.

The shepherds shift their park from time to time, to dung the ground, one part after another.

PARK is also used for a very large net, disposed on the brink of the sea, with only one hole, which looks towards the shore: and which becomes dry after the flood is gone off; so that the fish once got in have no way left to escape.

PARK, in *War*. PARK of *Artillery*, a post in a camp, out of cannon-shot of the enemy, and fortified to incamp the train of artillery, and to secure the magazines and ammunition, as well as the battalions of artillery, appointed for its service and defence. See ARTILLERY *Park*.

The figure of the park of artillery is commonly a parallelogram, unless the situation of the ground renders another necessary. The artillery is generally placed in the centre of the second line of encampment, and sometimes in the rear line, or corps of reserve. In both places the muzzles of the guns are in a line with the fronts of the serjeants' tents of the regiments of artillery and infantry. Some generals place the park about three hundred paces before the centre of the front line of the army: some place all the cannon and mortars in the front, together with their spare carriages; others are for dividing the equipage in brigades, and place the first in the front line, the second in the next, &c. But the most approved method, says Mr. Muller, *Artill.* p. 281, is to divide the artillery into brigades; and to place the guns of the first to the right of the front line, and their ammunition behind them; then those of the second brigade next to the first in the front, leaving five paces between them, and their ammunition behind them; and all the rest in the same order; the pontoons forming the last line. The artillery companies and miers are half encamped to the right, and the other half to the left of the park, with some of the lieutenants in the rear. At about twelve paces in the rear of the park, are encamped the civil list in one line; behind them, at the distance of thirty paces, is a line of the remaining lieutenants, and behind these the captains and commissaries, Opposite to the centre, and thirty paces behind the captain's line, is the major's tent; and behind this, at twenty paces,

the colonel's to the right, and the comptroller's to the left. Opposite to the centre, and fifty paces before the park, is placed the army guard; and opposite to the right wing, the artillery guard at the same distance. In the middle of the front, two light pieces are advanced at a distance of twenty paces, loaded with powder for the alarm guns, which are ready to be fired when required. To the right of the park are placed the artificers with their tools, materials, and baggage, in a line from the front to the rear. To the left of the park, the commissaries and their baggage; to the right of the artificers is encamped the first battalion of artillery, with their baggage and officers behind them; and to the left of the commissaries the second battalion in the same manner. The horses are placed behind the first battalion, except those of the picket in the rear of the park.

Every attack, at a siege, has its park of artillery.

PARK of Provisions, is a place in the camp, on the rear of every regiment, which is taken up by the sutlers, who follow the army with all sorts of provisions, and sell them to the soldiers.

PARK Bote, in our old *Writers*, signifies to be quit of inclosing a park or any part thereof. 4 Inst. 308.

PARKANY, in *Geography*, a town of Hungary, at the conflux of the rivers Gran and Danube; 2 miles N. of Gran.

PARKEL, a town of Hindoostan, in Golconda; 32 miles S.S.W. of Hydrabad.

PARKER, MATTHEW, in *Biography*, archbishop of Canterbury, was born at Norwich in 1504. He had the misfortune to lose his father when he was only twelve years of age; but his mother took care to place him under good masters, by whom he was well grounded in grammar-learning. In the year 1520 he was sent to Cambridge, and was entered of Corpus Christi college, of which house he was chosen a bible-clerk, or scholar, in the following year. Here he applied with great assiduity to his studies, and in 1523 was admitted to the degree of B.A. In 1527 he was ordained deacon, and afterwards priest; and in the same year he commenced M.A., and was chosen fellow of his college. When he was about 29 years of age, he preached his first sermon before the university; and almost immediately became a popular preacher in the neighbourhood of Cambridge. He had by this time imbibed the principles of the Reformation, and shewed so much zeal for them, that archbishop Cranmer granted him a licence to preach throughout his province. About this time he was sent for to court, and was made chaplain to queen Anne Boleyn, who appointed him, a short time before her death, to the particular charge of her daughter Elizabeth. About the year 1534 he was presented by the queen to the deanery of the college of Stoke, near Clare, in Suffolk, a preferment of small value in a pecuniary view, but affording him a pleasing place of retirement, when he chose to withdraw from the court, from which it was about 20 miles distance. Here he laboured to reform the Popish superstitious, and founded a grammar-school, for the instruction of youth in sound learning, and in the principles of the Christian religion. In 1537, after the death of queen Anne Boleyn, he was appointed one of Henry VIII.'s own chaplains; and in the following year he was created doctor of divinity. In 1541 he was installed prebendary in the cathedral church of Ely; and in 1542 he was presented by the chapter of Stoke to the rectory of Ashen, in Essex. He obtained other preferments in the church; and in 1544, on account of his high character and great learning, he was chosen master of Corpus Christi college, to which he afterwards became a liberal benefactor, and compiled for it a new body of statutes. In 1545 he was elected vice-chan-

cellor of the university of Cambridge; and in the same year he was presented by his college to the rectory of Landbeach, in Cambridgeshire. After the accession of king Edward VI. he married; and in 1549, being accidentally in Norfolk, during the time of Kett's rebellion, Dr. Parker had the resolution to go to the rebels' camp, where he preached to them under the oak of Reformation, exhorting them most earnestly to temperance, moderation, and submission to the king. In so doing, he run great risk of his life; but he fortunately escaped out of their hands. In 1551 Dr. Parker was included in a commission for correcting and punishing the Anabaptists; and about this time he preached a funeral sermon for Martin Bucer, regius professor of divinity, with whom he had been on terms of great intimacy. In 1552 Dr. Parker was presented by Edward VI. to a prebendary in the cathedral church of Lincoln, and also to the deanery of the same church. He had been nominated, previously to this, a chaplain to his majesty. Thus he lived in great reputation and affluence, during the reigns of Henry VIII. and Edward VI., and happy in the acquaintance and esteem of all the principal men of his time.

After the accession of queen Mary, Dr. Parker was deprived of all his preferments, and gladly withdrew into privacy. Great pains were taken to find out his retreat, but he eluded the machinations of his enemies; and on the death of the cruel and bigotted sovereign, he was by her successor preferred to the archbishopric of Canterbury, and was duly and regularly consecrated at Bow church; though the Papists, some years afterwards, propagated a report, that Parker had been consecrated at a tavern in Cheapside, which was proved most satisfactorily to be a calumny. Being thus constituted primate and metropolitan of the church of England, Dr. Parker endeavoured to fill the vacant sees with men of learning and distinguished piety, who were zealous for promoting the Reformation; and very soon after his own consecration, he consecrated, at Lambeth, Grindall, bishop of London, Cox, bishop of Ely, Sandys, bishop of Worcester, Jewel, bishop of Salisbury, and several others. He also extended his influence and his anxious concern for the Protestant interest to the kingdom of Ireland, sending over proper instructions to the archbishop of Dublin, for completing the work of reformation in the church of Ireland.

About this time archbishop Parker received a letter from Calvin, exhorting him to prevail with the queen to summon a general assembly of all the Protestant clergy, wheresoever dispersed, for the purpose of agreeing upon one common form of worship and of church government to be established, not only within her dominions, but also among the reformed and evangelical churches abroad. This letter was taken into consideration by the queen's council, who requested his grace to return thanks to Calvin for his proposals, but, at the same time to signify to him, that the church of England would still retain her episcopacy. It is not in our power, in this article, to notice all the attempts made by Elizabeth, in which the archbishop seems to have concurred, to introduce a uniformity of faith. In consequence of those proceedings against the Puritans, many churches in London, and in every part of the kingdom, were shut up for want of preachers. The sufferers under these persecutions, having been refused a hearing by the archbishop, and the other commissioners appointed by the queen, appealed to the public, and circulated various books and pamphlets in defence of their nonconformity. To some of these, answers were written, on the part of the bishops, either by themselves, or their chaplains; which were followed by replies from Puritans, whose tracts were eagerly sought after. In consequence

sequence of this, a decree was obtained from the star-chamber, prohibiting all books and pamphlets, in which any thing should be advanced against the queen's injunctions, and empowering the wardens of the stationers' company to search all suspected places for such books, and to bring the offenders before the ecclesiastical commissioners. This scandalous stretch of tyranny took place in the month of June, 1566. In the following year the archbishop founded three grammar-schools in Bennet-college; and two years afterwards, seven other schools, and two fellowships, in the same house. In 1568, a new folio edition of the English bible was published, chiefly under the inspection of archbishop Parker, with a preface written by him. It was commonly denominated the *bishops' bible*, on account of its having been revised and corrected principally by the bishops, from the translation published by Cranmer; and it was made use of in the churches, till the last translation took place in the reign of James I. One of the last acts in which the archbishop was employed was a metropolitan visitation of the diocese of Winchester, and in particular of the Isle of Wight, in 1575, in which he exercised such severities as exposed him to universal odium, and even induced the court to interfere and reverse his proceedings. He died in the month of May, 1575, when he was in the 71st year of his age, and was buried, with great magnificence and solemnity, in his own private chapel at Lambeth, under a tomb erected by himself, which remained there till 1648, when the tomb was pulled down, and the ashes of the prelate exposed to much insult. Some time after the restoration, they were decently re-interred in the place where the monument formerly stood, and another was now erected to his memory. Archbishop Parker has the honour to rank among the principal agents in exposing the superstitions of Popery, and in placing the Protestant religion on a permanent footing in England: he, however, sullied his reputation, by introducing into Protestantism much of the ecclesiastical pride and persecuting spirit of the church from which he separated. He was naturally of a warm temper, but, till his head was turned by his exaltation, he exhibited no instances of haughtiness or ill nature. He was to the last hospitable and charitable, and did many kind and benevolent things for private people, as well as for the public benefit. The regulation of his family was extremely laudable: he assigned all his domestics some particular employment, and suffered none to be idle. Those who were not occupied in learned pursuits, about the management of his revenues, or the affairs of his household, were variously employed; some in binding books, others in engraving, painting, transcribing manuscripts in fine hand-writing, drawing, or illuminating.

The archbishop was much attached to the study of British and Saxon antiquities, and he spared neither labour nor expense in collecting and preserving whatever manuscripts of this kind could be met with, of which a fatal havock and destruction had been made at the time of the dissolution of the monasteries. In 1563 he was the instrument of preserving two volumes of collections in folio, made by archbishop Cranmer. Whatever he was able to collect, he deposited in a library that he built for Corpus Christi college, in Cambridge. He published editions of four of our ancient English historians, *viz.* Matthew of Westminster, Matthew Paris, Thomas Walsingham, and Asser's Life of King Alfred. He also published "A Testimony of Antiquity, shewing the ancient Faith of the Church of England, touching the Sacrament of the Body and Blood of the Lord, here publicly preached, and also received, in the Saxons' Time, about seven hundred Years ago, being a Sermon translated out of Latin into Saxon by Ælfric, Abbot of St.

Albans, about the year 996, and appointed to be delivered to the People at Easter, before they should receive the Communion." Another considerable work of the archbishop contains the lives of his predecessors in the see of Canterbury, and is entitled "De Antiquitate Britannicæ Ecclesiæ, et Privilegiis Ecclesiæ Cantuariensis, cum Archiepiscopis ejusdem LXX, 1572." The materials for this performance were collected from ancient historians, by John Jofeline, secretary or chaplain to the prelate, who was himself the digester and compiler of it. The best edition of this work is that of 1729, illustrated with fine engravings. Biog. Brit. Neal's Hist. of Puritans.

PARKER, SAMUEL, an English bishop, son of John Parker, a serjeant at law under the protectorate of Oliver, and also after the restoration, was born at Northampton in 1640. He was educated in grammar-learning among the Puritans, at his native place; after which he was sent, in 1656, to the university of Oxford, where he was entered of Wadham college. Here he is said to have led a very strict and religious life. In 1659 or 1660 he was admitted to the degree of B.A. Although now a zealous Puritan, he became, at the restoration of Charles II., violently attached to the court, obtained preferment, and was, in 1667, appointed chaplain to Dr. Sheldon, archbishop of Canterbury. In 1670 he was nominated to the archdeaconry of Canterbury, and obtained several other benefices. In the reign of James II. he was made, for his fervility to the king's arbitrary measures, bishop of Oxford and privy counsellor. He was also constituted, by mandamus, president of Magdalen college, in violation of the privileges of that society. He was author of a number of works; and he left behind him, in manuscript, "A History of his own Times," in Latin, which was published in 1726, under the title of "Reverendi admodum in Christo Patris Samuelis Parkeri, &c. de Rebus sui Temporis Commentariorum Libri quatuor," of which two English versions afterwards appeared. He died in March, 1687-8, at the age of 48, unlamented and despised by good men. Bishop Burnet says, "he was a man of no judgment, and of as little virtue; and as to religion, rather impious. He was covetous and ambitious; and seemed to have no other sense of religion but as a political interest, and a subject of party and faction." Biog. Brit. Burnet's Hist.

PARKER'S Bay, in *Geography*, a bay on the south coast of Jamaica, south of Palmetto point.

PARKER'S Creek, a river of Maryland, which runs into the Chesapeake, N. lat. 38° 32'. W. long. 76° 39'.

PARKER'S Island, an island in the Chesapeake, near the coast of Maryland; 15 miles S. of Annapolis. N. lat. 38° 53'. W. long. 76° 41'.—Also, an island called *Ruskobegan*, in Lincoln county, and state of Maine, formed by the waters of Kennebeck river west, by the sea south, by Jeremysquan bay east, and by a small strait which divides it from Arouseag island north; so called from John Parker, who purchased it from the natives in 1650: part of it still remains to his posterity. It is in the township of Georgetown.

PARKER River, a river which takes its rise in Boxford, in the Massachusetts, and pursuing a variable course, at length wanders through the marshes, and enters Plum island sound by a mouth about a quarter of a mile wide. It is richly stored with fish, and is navigable for coasting vessels to the head of the tide, but obstructed by two bridges.

PARKGATE, or *the New Quay*, a sea-port and hamlet in the parish of Great Neiton, hundred of Wirral, and county-palatine of Chester, England, is situated on the north-eastern bank of the estuary of the river Dee, at the distance

distance of twelve miles from the county-town, and one hundred and ninety-three from London. This place has of late years become a convenient and fashionable bathing place, and is also celebrated as a station for the Irish packets, which sail from Dublin four times a week. The houses here are chiefly disposed in one long street stretching itself parallel with the river, and are mostly neat modern buildings of brick. The chief support of Parkgate arises from the custom of the passengers to and from Ireland, and from its celebrity as bathing-quarters. Beauties of England and Wales, by E. W. Bravley and John Britton, F.S.A.

PARKHURST, JOHN, in *Biography*, second son of John Parkhurst, esq. of Catesby in Northamptonshire, was born in June 1728. He was educated in grammar learning at Rugby school, in Warwickshire. Being intended for the church, he was entered of Clare-hall, in the university of Cambridge. Here he took his degrees of B. A. and M. A. in 1752, and was many years fellow of his college. Soon after he had entered into holy orders, by the death of his eldest brother he became heir to a very considerable estate, but neither then, nor at the death of his father, when he came into possession, did his accession of fortune produce any change in his manners or pursuits. He still continued to cultivate the studies becoming the clerical profession, paying particular attention to that of the original languages of the Jewish and Christian scriptures. He never obtained any preferment in the church, yet he took pleasure in the exercise of the clerical duty, and for a long time officiated in the capacity of curate, with exemplary zeal and diligence, but without any salary, in his own chapel at Catesby, which afterwards served as a parish church. When he became possessed of the right of presentation to a living, he considered church-patronage as a trust, rather than property, and instead of taking it himself, he bestowed it on a gentleman, known to him only by character, from no motive but a persuasion that he would faithfully discharge the duties of his office. In 1754 Mr. Parkhurst married a lady, by whom he had a daughter and two sons, and after her death he married a second time, by whom he had one daughter, who had a passion for classical learning, and who arrived at a degree of perfection in it, which is seldom met with among females. He was first known as an author in 1753, by publishing a "Friendly Address to the Rev. John Wesley;" his next work was "An Hebrew and English Lexicon, to which is added a Methodical Grammar, adapted to the use of Learners." This performance reflects much credit on his learning and patient enquiry, and may be recommended as affording valuable assistance to the biblical student in forming an acquaintance with the Hebrew scriptures. In 1778 a second edition of it was published with corrections and improvements, and a third was given to the public in 1792. The author had, however, in the mean time, published a "Greek and English Lexicon to the New Testament," to which was prefixed a plain and easy Greek grammar. A second edition of this work was published in 1794, and it was the intention of the author to give new editions of them in octavo, but he died before he could complete the business, and the task of editing them devolved on his younger daughter, the wife of the Rev. Joseph Thomas. Mr. Parkhurst departed this life, after a long and painful illness, in February 1797. Through his whole life he had been a most assiduous student; for many years it was his usual practice to rise at five o'clock, and in winter to light his own fire. He was attached to the works of Hutcheson, but was well acquainted with their defects as well as their excellencies. He was an ardent lover of the truth, and was not afraid to avow his sentiments. In forming his religious principles, he followed no guide but the

scriptures, the study of which was the business and the pleasure of his life. Mr. Parkhurst at one period of his life engaged in a controversy with Dr. Priestley respecting the divinity and pre-existence of Christ. He was naturally irritable, warm, and earnest in his resentments, but he effectually subdued this temper by an attention to the injunctions of religion, and passed through a long life in peace and harmony with all around him, respected by men of learning, beloved by his friends, and honoured by his family.

PARKI, in *Geography*, a town of Bengal; 32 miles N. of Ramgur.

PARKINSON, JOHN, in *Biography*, a celebrated old herbalist, of the latter part of the 16th century, and the first half of the 17th, was born in 1567, and bred up as a London apothecary. He is mentioned by his contemporaries as a man of eminence in his profession, and was at length appointed apothecary to king James I. King Charles I. afterwards conferred upon him the title of *Botanicus Regius Primarius*. A great share of his attention, during a long life, was devoted to the study of plants. He had a garden well stored with rarities, and he bestowed equal notice upon the curiosities of the flower-garden, in all their luxuriant Proteus-like varieties, and on the native productions of his own and other countries, embracing their literary history, as well as their practical investigation.

His first publication was his *Paradisus in Sole Paradisus terrestris, or a choice Garden of all sorts of Rare Flowers, &c.; to which is annexed a Kitchen Garden, &c.* This was printed at London, anno 1629, in a folio of 612 pages. A second edition, "much corrected and enlarged," appeared in 1656, after the decease of the author. Both editions are dedicated "to the Queen's most excellent Majesty," which could hardly have been, as Dr. Pulteney supposed, Queen Elizabeth; but rather the Queen of Charles I.; and it is to the honour of those who edited the new impression, in 1656, that this dedication was not then suppressed. About a thousand plants, either species or varieties, are described in this book, of which 780 are figured, in wood cuts, partly copied from Clusius and Lobel, partly original, but all of them coarse and stiff, though sometimes expressive. Numerous remarks are interspersed, respecting the botanical history or medical virtues of the plants, as well as their culture; but the latter subject is, for the most part, given in the introductory chapters, which display no small degree of intelligence and experience. This book affords a very correct and a very respectable idea of the gardens of our ancestors, at the time it was written, and has been considered, by the learned authors of the Hortus Kewensis, unequivocal authority as to the time when any particular species was introduced or cultivated among us. The florist and the kitchen gardener will find some productions recorded which have since disappeared, and though our kitchen gardens had not arrived at such luxuriant perfection or variety as they afterwards attained, in King William's days, and have since preserved, there is reason to think the science of horticulture declined considerably after the time of Parkinson, previous to its restoration at the end of the 17th century. As to the botanic garden, Dr. Pulteney remarks, from an investigation of the *Paradisus Terrestris*, that "intertropical productions had, at this period, been but sparingly imported. The real stove plants are very rare throughout the book. There are some American species, and particularly from Virginia, as being a part of that continent with which England had the most frequent intercourse. But the principal productions of the English gardens were exotic European, and Grecian plants, some Asiatic, and a few from the northern coasts of Africa."—It is no small praise to the work before us, that

the late Mr. Curtis held it in particular estimation. He always cites it in his Magazine with peculiar pleasure and respect, giving many a specimen of the old writer's amusing quaintness, whilst he enriches us with his information.

In 1640 our author published his principal work, the "*Theatrum Botanicum*, or Theatre of Plants, or an Herbal of large extent; &c." This is a ponderous folio of 1746 pages, with innumerable wooden cuts. This work and the Herbal of Gerarde were the two main pillars of Botany in England till the time of Ray, who indeed gave them fresh importance by his continual reference to their contents. These volumes were dispersed throughout the country, one or other, or both, being the inexhaustible resource of all who had any love for plants, or any interest in enquiring into their qualities. The benevolent country divine, the lady of the manor, the village doctor, and the humble herb-gatherer employed in the service of all the rest, consulted Gerarde or Parkinson, as they would have consulted their bibles, and with little less implicit confidence. Of these two writers it is justly observed that Parkinson was by far the most original and the most copious, but his cuts being of vastly inferior merit to those admirable ones, prepared for Conrad Gesner, with which Gerarde had the means of adorning his publication, the latter has greatly prevailed in popularity, as a book of reference. It is indeed chiefly for the figures that we now cite these works. Nice distinctions of species, or any discrimination between species and varieties, are not to be expected; still less, any ideas of classification or scientific arrangement, worthy a moment's consideration or comparison. Parkinson is much more original than Gerarde in his descriptions, and more particular in his indications of the places of growth; he is also very learned and critical in his synonymy, and, above all, in the medical part of his subject. Gerarde, though intelligent and industrious, was fundamentally a compiler, without always taking the pains to accommodate his text to the country in which he published, as we have already sufficiently noted; see GERARDE. It is not to be wondered at if these great works contain some hundreds of repetitions, when we consider how obscurely many plants had been described, or even figured, by previous authors; inasmuch that it was, in many cases, next to impossible to discover whether a given plant had been described before. Parkinson however is entitled to superior praise on this head, having taken all possible pains to avoid such mistakes, by his deep study of synonyms. Some papers of Lobel are said to have fallen into the hands of Parkinson, after the death of the former, which proved of use to his undertaking, but it does not appear that he implicitly confided in such, any more than in previously printed authorities, without a due investigation, and therefore they became in some measure his own.

The time of Parkinson's decease is not known, but he appears to have been living when his Herbal was published, in 1640, at which period he was, if Dr. Pulteney's date of his birth be correct, 73 years old. Nothing is recorded of his family. Some copies of his *Paradisus* have an engraved portrait of the author, done in his 62d year, and there is a small oval one in the title-page of his *Herbal*, or *Theatrum Botanicum*. Pulteney's Sketches of the progress of Botany in England. Haller Bibl. Bot. Parkinson's Works. S.

PARKINSONIA, in *Botany*, was dedicated to the memory of our laborious English herbalist, (see the last article.) by Plumier, who observes that his *Theatrum Botanicum* embraces a wider range of species, than any previous history of plants.—Plum. Gen. 25. t. 3. Linn. Gen. 206. Schreb. 277. Willd. Sp. Pl. v. 2. 513. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 24. Juss. 347. Lamarck Illustr.

t. 336.—Class and order, *Decandria Monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf; its base bell-shaped, shallow, permanent; border in five deep, ovate, acute, coloured, spreading, nearly equal, deciduous segments. *Cor.* Petals five, with claws, widely spreading, wavy, nearly equal; four of them ovate; the lowermost kidney-shaped, with a longer claw. *Stam.* Filaments ten, awl-shaped, rather declining, shorter than the corolla, villous in their lower part; anthers oblong, incumbent. *Pist.* Germen superior, long, cylindrical, declining; style thread-shaped, curved upwards, the length of the stamens; stigma obtuse. *Peric.* Legume very long, roundish, with numerous bead-like swellings, pointed. *Seeds* several, one in each tumid part of the legume, obovate, roundish, obtuse.

Ess. Ch. Calyx five-cleft; its segments deciduous. Petals four of them ovate; the fifth kidney-shaped. Style awl-shaped. Legume beaded, with many roundish seeds.

1. *P. aculeata*. Prickly Parkinsonia. Linn. Sp. Pl. 536. Hort. Cliff. 157. t. 13. Jacq. Amer. 121. t. 80. Walth. Hort. 36. t. 13.—Native of South America and the West Indies. Miller appears to have cultivated this plant in 1739, and it is often to be seen in stoves, but we never heard of its flowering in England. Jacquin describes it as a very elegant tree, about twelve feet high, with a green shining bark, turning brown and striated on the trunks of older individuals only. Wood white. Prickles solitary, awl-shaped, somewhat recurved, under the insertion of each leaf, about four lines long; on the older branches they are often three together, in which case the middlemost becomes much larger and stronger. Leaves alternate, with an axillary tuft of three, four, or five besides, pinnate, shining; the midrib about a foot long, flattened and linear; leaflets extremely numerous, minute, obovate, entire. Clusters axillary and terminal, lax, simple, smooth, each consisting of about ten sweet-smelling yellow flowers, about an inch or rather more in diameter, their kidney-shaped petal besprinkled with scarlet dots at the base. Leaves yellowish. Seeds variable in number, tumid, polished.

Jacquin says this shrub grows very quickly, flowering the first year after it is sown, and combining with the *Poinciana*, or Barbadoes Flower-fence, to make the most beautiful of all hedges. Dr. Swartz has it not in his *Prodromus* or *Flora*, so that it seems not to be a general West Indian plant.

PARKINSONIA, in *Gardening*, contains a plant of the exotic flowering tree kind, of which the species is the prickly Parkinsonia (*P. aculeata*). In Jamaica it is called the *Jerusalem thorn*. These trees perfume the air to a considerable distance; for which reason the inhabitants of the West Indies plant them about their houses.

Method of Culture.—It is capable of being increased here by sowing the seeds in pots filled with light rich mould, early in the spring season, plunging them in a hot-bed. When the plants have attained a few inches in growth, they should be carefully removed into other small pots, separately re-plunging them into the hot-bed, shading them till fresh rooted, when fresh air should be admitted according to the warmth of the season. The only method by which these plants have been kept with success through the winter, in this climate, has been by hardening them in July and August to bear the open air; and in September placing them on shelves in the dry stove, at the greatest distance from the fire, so that they may be in a very temperate state of warmth.

These plants afford ornament among other potted plants of the stove kind.

PARKON, in *Geography*, a town of Austrian Poland, in Galicia; 30 miles N.N.W. of Chelm.

PARKSTEIN, a town of Bavaria, in the principality of Sulzbach; 17 miles N.E. of Sulzbach.

PARLAGOW, a town of Hindooftan, in Candeish; five miles E. of Barawnay.

PARLASCA, a town of Italy, in the department of the Lario; five miles N. of Como.

PARLEY, formed of the French *parler*, to speak, talk, a conference with an enemy, &c.

Hence to beat or sound a parley, is to give a signal for the holding such a conference, by beat of drum, or sound of trumpet. See **CHAMADE**.

PARLIAMENT, **PARLIAMENTUM**, in England, a grand assembly, or convention, of the three estates of the kingdom, *viz.* lords spiritual, lords temporal, and commons, summoned to meet the king, to consult of matters relating to the commonweal; and particularly to enact, and repeal, laws.

The word *parliament*, *parlement*, or *colloquium*, as some of our historians translate it, is comparatively of modern date, derived from the French, and signifying the place where they met and conferred together. It was first applied to general assemblies of the state under Louis VII. of France, about the middle of the twelfth century. The first mention of it in our statute law is in the preamble to the statute of West. 1. 3 Edw. I. A. D. 1272. But long before the introduction of the Norman language into England, all matters of importance were debated and settled in the great councils of the realm; a practice which seems to have been universal among the northern nations, particularly the Germans: and carried by them into all the countries of Europe, which they overran at the dissolution of the Roman empire.

The two houses of parliament are the king's grand council.

Till the conquest, the great council, consisting only of the great men of the kingdom, was called *magnatum conventus*, and *prælatorum procerumque concilium*, *assisa generalis*, and sometimes *communitas regni Angliæ*. The Saxons, in their own tongue, called it *wittenagemote*, *i. e.* *assembly of the wise*; and it hath subsisted immemorially under these appellations and others, as *michel-synoth*, or *great council*; and *michel-gemote*, or *great meeting*.

We have instances of its assembling to order the affairs of the kingdom, to make new laws, and to amend the old, so early as the reign of Ina, king of the West Saxons, Offa, king of the Mercians, and Ethelbert, king of Kent, in the several realms of the heptarchy. And after their union, the Mirror informs us, that king Alfred ordained for a perpetual usage, that these councils should meet twice in the year, or oftener, if need be, to treat of the government of God's people: how they should keep themselves from sin, live in quiet, and receive right. Our succeeding Saxon and Danish monarchs held frequent councils of this sort, as appears from their respective codes of laws; the titles of which speak them to be enacted either by the king, with the advice of his *wittenagemote* or wise men, or by those sages with the advice of the king, or by them both together. These great councils were also, without doubt, held regularly under the first princes of the Norman line. Glanvil, who wrote in the reign of Henry II. speaking of the particular amount of an amercement in the sheriff's court, says, it had never yet been ascertained by the general assize, or assembly, but was left to the custom of particular countries. In Edward III.'s time, an act of parliament, made in the reign of William the Conqueror, was pleaded in the case of the abbey of St. Edmund's-bury, and judicially allowed by the court. Hence

it appears, that parliaments or general councils are coeval with the kingdom itself. Though the high antiquity of parliaments in this kingdom must be universally allowed, it does not so clearly appear how they were composed; and particularly whether the commons were summoned at all, or, if summoned, at what period they began to form a distinct assembly. Nevertheless it is generally agreed, that in the main the constitution of parliament, as it now stands, was marked out so long ago as the seventeenth year of king John, A. D. 1215, in the great charter granted by that prince, in which he promises to summon all archbishops, bishops, abbots, earls, and greater barons, personally; and all other tenants in chief under the crown, by the sheriff and bailiffs; to meet at a certain place, with forty days' notice, to assess aids and scutages when necessary. And this constitution has subsisted in fact at least from the year 1266 (49 Hen. III.), there being still extant writs of that date, to summon knights, citizens, and burghesses to parliament.

Sir Walter Raleigh, in his *Prerogative of Parliament*, thinks the commons were first called in the seventeenth of Hen. I. and Dr. Heylin fixes the time of their first admission to the reign of Henry II.

Indeed, sir Edward Coke, Dodderidge, Prynne, and others, have shewn, that the commons of England had always a share in the legislature, and a place in the great assemblies; though not on the present footing, as making a distinct house, and as composed of knights, citizens, and burghesses.

Parliaments are to be summoned, prorogued, and dissolved by the king alone: nor can a parliament begin without the king's presence, or that of his commissioners.

At first, new parliaments were called every year; by degrees their term grew longer. In the time of king Charles II. they were held a long time with great interruptions between them. Both which methods were found of such ill consequences, that in the beginning of the reign of king William an act was passed, whereby the term of all parliaments was restrained to three sessions, or three years; this was hence called the *Triennial act*. Since that, from other views, the period of parliaments is lengthened to seven years.

A parliament is called by the king's writ, or letter directed to each lord, commanding him to appear; and by other writs directed to the sheriffs of each county, to summon the people to elect two knights for each county, and one or two burghesses for each borough, &c.

This writ is issued out of chancery by advice of the privy council, at least forty days before it begins to sit. This right of summons is a branch of the royal prerogative; so that no parliament can be convened by its own authority, or by the authority of any, except the king alone. Nor is it an exception to this rule, that, by some modern statutes, on the demise of a king or queen, if there be then no parliament in being, the last parliament revives, and is to sit again for six months, unless dissolved by the successor; for this revived parliament must have been originally summoned by the crown. Indeed, by statute 16 Car. I. c. 1. it was enacted, that if the king neglected to call a parliament for three years, the peers might assemble and issue out writs for choosing one; and, in case of neglect of the peers, the constituents might meet and elect one themselves. This act, however, was deemed injurious to the royal prerogative, and repealed by statute 16 Car. II. c. 1.

There are, it must be acknowledged, two capital exceptions to this rule, which were justifiable on a principle of necessity, that supercedes all law. The convention parliament, that reformed king Charles II. met above a month before his return; the lords by their own authority, and the commons

in pursuance of writs issued in the name of the keepers of the liberty of England by the authority of parliament; and this parliament sat full seven months after the restoration, and enacted many laws still in force. But the first thing done after the king's return, was to pass an act declaring this to be a good parliament, notwithstanding the defects of the king's writs. And it was thought farther necessary to confirm its acts in the next parliament, by 13 Car II. cap. 7. and cap. 14. The other exception occurs at the time of the revolution, A. D. 1688, when the lords and commons by their own authority, and upon the summons of the prince of Orange (afterwards king William), met in a convention, and disposed of the crown and kingdom. The throne at this time was vacant by the abdication of king James II. and it was declared by W. & M. stat. 1. cap. 1. that this convention was really the two houses of parliament, notwithstanding the want of writs, and other defects of form.

As the king only can convoke a parliament, he is bound to do this every year, or oftener, if need be. And by 16 Car. II. cap. 1. it is enacted, that the sitting and holding of parliaments shall not be intermitted above three years at the most: by 1 W. & M. stat. 2. cap. 2. it is declared to be one of the rights of the people, that for redress of all grievances, and for the amending, strengthening, and preserving the laws, parliaments ought to be held frequently; and this indefinite frequency is reduced to a certainty by 6 W. & M. cap. 2. which enacts, that a new parliament shall be called within three years, after the determination of the former.

As to the constituent parts of a parliament, these are the king, who sits there in his royal political capacity, and the three estates of the realm; the lords spiritual, the lords temporal, who sit together with the king in one house, and the commons, who sit by themselves in another. And the king, and these three estates together, form the great corporation or body politic of the kingdom, (4 Inst. 1, 2. stat. 1. Eliz. c. 3. Hale of Parl. 1.) of which the king is said to be *caput, principium, and finis*. (See KING.) For upon their coming together the king meets them, either in person, or by representation, without which there can be no beginning of a parliament; and he also alone has the power of dissolving them. 4 Inst. 6.

The spiritual lords consist of two archbishops and twenty-four bishops, who are supposed to hold certain ancient baronies under the king, in right of which they obtain their seats in the house of lords; where they intermix in their votes with the temporal lords, so that in every effectual sense they form one estate. (See ARCHBISHOP and BISHOP.) The lords temporal consist of all the peers of the realm, as dukes, marquises, earls, viscounts, and barons. Some of these sit by descent, as do all ancient peers; some by creation, as do all new made ones; others, since the union with Scotland, by election, which is the case of the sixteen peers, who represent the body of the Scotch nobility: and twenty-eight peers for Ireland, besides one archbishop and three bishops. Their number is indefinite, and may be increased at will by the power of the crown. See PEER.

The commons consist of all such men of any property in the kingdom as have not seats in the house of lords; every one of whom has a voice in parliament, either personally, or by his representative. See COMMONS.

The number of English representatives is five hundred and thirteen (*viz.* ninety-two knights of shires, fifty citizens for twenty-five cities, Ely sending none, and London four; three hundred and thirty-four burgesses for one hundred and sixty-seven boroughs, two each; five for five boroughs, one each; and twelve for twelve boroughs in Wales, Pem-

broke sending two, and Merioneth none; four for the two universities, and sixteen for the eight cinque ports), of Scots forty-five, and of Irish one hundred; so that the representatives of the united kingdom amount to 658. The consent of all these three parts is required to make any new law that shall bind the subject. Whatever is enacted for law by one, or by two only, of the three, is no statute, and no regard is due to it, except in matters relating to their own privileges. It is particularly enacted by statute 13 Car. II. c. 1. that if any person shall maliciously or advisedly affirm, that both, or either of the houses of parliament have any legislative authority without the king, such person shall incur all the penalties of a "præmunire."

The jurisdiction of parliament thus composed and considered as an aggregate body, is so transcendent, says sir Edward Coke (4 Inst. 36.), that it makes, enforces, enlarges, restrains, abrogates, repeals, revives, and expounds laws and statutes, concerning matters ecclesiastical, civil, criminal, martial, maritime, &c. And for making of laws, and in proceeding by bill, this supreme court is not confined either for causes or persons within any bounds; nor is it tied down to any certain rules or forms of law, in proceedings and determinations: the court of parliament hath power to judge in matters of law; and redress mischiefs and grievances that happen, especially such as have no ordinary remedy; to examine into the corruption of judges and magistrates, and illegal proceedings of other courts; to redress errors, and determine on petitions and appeals, &c. and from this high court there lies no appeal.

It can regulate or new model the succession to the crown; as in the reign of Henry VIII. and William III. It can alter the established religion of the land, as was done in the reigns of king Henry VIII. and his three children. It can change and create afresh even the constitution of the kingdom, and even of parliaments themselves, as was done by the act of union, and the several statutes for triennial and septennial elections. And, therefore, some have not scrupled to call its power, by too bold a figure, the omnipotence of parliament. It is therefore, as judge Blackstone observes, a matter most essential to the liberties of the kingdom, that such members be delegated to this important trust, as are most eminent for their probity, their fortitude, and their knowledge; for it was a known apophthegm of the great lord treasurer Burleigh, "that England could never be ruined but by a parliament;" and as sir Matthew Hale observes, this being the highest and greatest court, over which none other can have jurisdiction in this kingdom, if by any means a misgovernment should any way fall upon it, the subjects of this kingdom are left without all manner of remedy. To the same purpose the president Montesquieu (we trust too hastily,) presages; that as Rome, Sparta, and Carthage, have lost their liberty and perished, so the constitution of England will in time lose its liberty and perish: it will perish, whenever the legislative power shall become more corrupt than the executive.

Affairs of parliament are to be determined by the parliament; and though the parliament err, it is not reverfible in any other court: and not only what is done in the house of commons, but what relates to the commons during the parliament, and sitting of the parliament, is no where else to be punished but by themselves, or a succeeding parliament. Every court of justice having laws and customs for its direction, the high court of parliament hath its own proper laws and customs, called the laws and customs of parliament; in-somuch that no judges ought to give any opinion of matters done in parliament, because they are not to be decided by

the common law : but the parliament, in their judicial capacity, are governed by the common and statute laws, as well as the courts in Westminster-hall.

The lords and commons in their respective houses have power of judicature, and so have both houses together : and in former times, both lords and commons sat together in one house of parliament. The king cannot take notice of any thing said to be done in the house of commons but by the report of the house ; and every member of the house of parliament has a judicial place, and can be no witness.

The house of lords is a distinct court of judicature from the commons, to several purposes ; they try criminal causes on impeachments of the commons, and have an original jurisdiction for the trial of peers upon indictments found by a grand jury : they also try causes upon appeals from the court of chancery, or upon writs of error to reverse judgments in the king's bench, &c. Also the house of commons is a distinct court to many purposes ; they examine the right of elections, expel their own members, and commit them to prison, and sometimes other persons, &c. And the book of the clerk of the house of commons is a record.

In order to prevent the mischief that might arise from reposing such extensive authority with incompetent persons, it is provided by the custom and law of parliament, that no one shall sit or vote in either house, unless he be twenty-one years of age. (7 & 8 W. III. cap. 25.) No member shall sit or vote in either house, till he hath, in the presence of the house, taken the oaths of allegiance, supremacy, and abjuration, and subscribed and repeated the declaration against transubstantiation, and invocation of saints, and the sacrifice of the mass. (30 Car. II. stat. 2. 1 Geo. I. c. 13.) No alien, even though he be naturalized, shall be capable of being a member of either house of parliament. (12 & 13 W. III. c. 2.) As to the qualifications of members of the house of commons, besides the above qualifications, it is declared and required by the law of parliament or special statutes, that they must not be any of the twelve judges, because they sit in the lords house, nor of the clergy, because they sit in convocation, nor persons attainted of treason or felony, because they are unfit to sit any where : that sheriffs of counties, and mayors, and bailiffs of boroughs, are not eligible in their respective jurisdictions, as being returning officers : that no persons concerned in the management of any duties or taxes created since 1692, except the commissioners of the treasury, nor any of the officers following, *viz.* commissioners of prizes, transports, sick and wounded, wine licences, navy and victualling ; secretaries or receivers of prizes, comptrollers of the army accounts, agents for regiments, governors of plantations and their deputies, officers of Minorca or Gibraltar, officers of the excise and customs, clerks or deputies in the several offices of the treasury, exchequer, navy, victualling, admiralty, pay of the army or navy, secretaries of state, salt, stamps, appeals, wine licences, hackney-coaches, hawkers, and pedlars ; nor any persons that hold any new office under the crown, created since 1705, are capable of being elected members : that no person having a pension under the crown during pleasure, or for any term of years, is capable of being elected ; that if any member accepts an office under the crown, except an officer in the army or navy accepting a new commission, he vacates his seat, but is capable of being re-elected : and moreover, persons in particular circumstances have forfeited the right of choice, and have been declared ineligible for that parliament by a vote of the house of commons, or *for ever*, by an act of the legislature. By 22 Geo. III. c. 45. contractors are ineligible. It has been also required, in strictness, that all members should

be inhabitants of the places for which they are chosen, but this is altogether disregarded and repealed by 14 Geo. III. c. 53. For other qualifications, and for the qualifications of electors, see BURGESS and KNIGHTS of the Shire.

As for the method of proceeding in elections ; when the parliament is summoned, the lord chancellor (or if a vacancy happens during parliament, the speaker, by order of the house) sends his warrant to the clerk of the crown in chancery ; who issues out writs to the sheriff of every county, for the election of all the members to serve for that county, and every city and borough in it. Within three days after the receipt of this writ, the sheriff is to send his precept, under his seal, to the proper returning officers of the cities and boroughs, commanding them to elect their members : and the said returning officers are to proceed to election within eight days from the receipt of the precept, giving four days notice of the same ; and to return the persons chosen, together with the precept, to the sheriff. But elections of knights of the shire must be proceeded to by the sheriffs themselves in person, at the next county court, that shall happen after the delivery of the writ. If this court falls upon the day of delivering the writ, or within six days after, the sheriff may adjourn the court and election to some other time, not longer than sixteen days, nor shorter than ten ; but he cannot alter the usual place without consent of the candidates : and in all such cases, ten days public notice must be given of the time and place of election. In order to prevent all undue influence, as soon as the time and place of election, in counties or boroughs, are fixed, all soldiers quartered in the place are to remove at least one day before the election, to the distance of two miles or more ; and not to return till one day after the poll is ended. By vote of the house of commons, no lord of parliament, or lord lieutenant of a county, hath any right to interfere in the election of commoners ; and by statute, the lord warden of the cinque ports shall not recommend any members there. If any officer of the excise, customs, stamps, or other branches of the revenue presumes to intermeddle in elections, by persuading or dissuading any voter, he forfeits 100*l.* and is disabled to hold any office.

For the provisions against bribery, see BRIBERY.

On the day of election, the returning officer first takes an oath against bribery, and for the due execution of his office ; the candidates, also, if required, must swear to their qualifications ; and the electors, both in counties and boroughs, are compellable to take the oath of abjuration, and that against bribery and corruption. When the election is closed, the returning officer in boroughs returns his precept to the sheriff with the persons elected by the majority : and the sheriff returns the whole, together with the writ for the county, and the knights elected, to the clerk of the crown in chancery, before the day of meeting, if it be a new parliament ; or within fourteen days after the election, if it be an occasional vacancy ; under penalty of 500*l.* If the sheriff does not return such knights only as are duly elected, he forfeits, by the old statutes of Henry VI. 100*l.* ; and the returning officer in boroughs, for a like false return, 40*l.* ; and they are besides liable to an action, in which double damages shall be recovered, by the later statutes of king William : and any person bribing the returning officer shall also forfeit 300*l.* But the members returned by him are the sitting members, until the house of commons, upon petition, shall adjudge the return to be false and illegal.

The privileges of parliament are very large and indefinite : the chief of these are privilege of speech, of person, of their domestics, and of their lands and goods. Privilege of speech is declared to be one of the liberties of the people, and

and it is declared by statute 1 W. & M. stat. 2. cap. 2. that the freedom of speech and debates, and proceedings in parliament, ought not to be impeached or questioned, in any court or place out of parliament. And this freedom of speech is particularly demanded of the king in person, by the speaker of the house of commons, at the opening of every new parliament. So likewise are the other privileges, which are immunities as ancient as Edward the Confessor, and the old Gothic constitution. To assault by violence a member of either house, or his menial servants, is a high contempt of parliament, and there punished with the utmost severity: and there are also penalties annexed to it in the courts of law, by the statutes 5 Hen. IV. cap. 6. and 11 Hen. VI. cap. 11. Neither can any member of either house be arrested and taken into custody, unless for some indictable offence, without a breach of the privilege of parliament. But all other privileges, which derogate from the common law, in matters of civil right, are now at an end, save only as to the freedom of the member's person; which in a peer (by the privilege of peerage) is always inviolable, and in a commoner for forty days after every prorogation, and forty days before the next meeting; and this is commonly as long as the parliament subsists, it seldom being prorogued for more than four more days at a time.

As to all other privileges, which obstruct the ordinary course of justice, they were restrained by the statutes 12 W. III., 2 & 3 Ann. c. 18, and 11 Geo. II. c. 24, and are now totally abolished by the statute 10 Geo. III. c. 50, which enacts, that any suit may at any time be brought against any peer or member of parliament, their servants, or any other person entitled to privilege of parliament, which shall not be impeached or delayed by pretence of any such privilege; except that the person of a member of the house of commons shall not thereby be subjected to any arrest or imprisonment. Likewise, for the benefit of commerce, it is provided by statute 4 Geo. III. c. 33, that any trader, having privilege of parliament, may be served with legal process for any just debt to the amount of 100*l.*; and unless he makes satisfaction within two months, it shall be deemed an act of bankruptcy; so that commissions of bankruptcy may be issued against such privileged traders, in like manner as against any other. See farther, on this subject, under the article COMMONS.

As to the special privileges and claims of peers, we may observe, that, by the charter of the forest, confirmed in parliament 9 Hen. III. every lord, spiritual or temporal, summoned to parliament, and passing through the king's forests, may, both in going and returning, kill one or two of the king's deer without warrant. They have also a right to be attended by the judges of the court of king's bench and common pleas, and such of the barons of the exchequer as are of the degree of the coif, or have been made serjeants at law, and likewise by the masters of the court of chancery, for their advice in point of law, &c. The secretaries of state, the attorney and solicitor-general, and the rest of the king's learned counsel, being serjeants, were also used to attend the house of peers, and have, to this day, their regular writs of summons issued out at the beginning of every parliament: but as many of them have of late years been members of the house of commons, their attendance here is fallen into disuse. Every peer, by licence obtained from the king, may make another lord of parliament his proxy, to vote for him in his absence; which no member of the house of commons can do, because he is himself but a proxy for a multitude of other people. Each peer has also a right, by leave of the house, when a vote passes contrary to his sentiments, to enter his dissent on the journals of the house, with the reasons

for such dissent, which is usually styled his *protest*. All bills, likewise, that may in their consequences affect the rights of the peerage, are by custom of parliament to have their commencement in the house of peers, and to suffer no amendments or changes in the house of commons. Moreover, the statute 6 Ann. cap. 23. which regulates the election of the sixteen representative peers of North Britain, peculiarly relates to the house of lords.

The special privilege and right of the house of commons comprehend all grants of subsidies or parliamentary aids, which begin with them, and are first bestowed in their house. See MONEY Bills.

The place where the parliament meets is wherever the king pleases: of late it has been in the palace of Westminster, the lords and commons each in a distinct apartment. In the lords house the princes of the blood are placed in distinct seats; the great officers of state, dukes, marquises, and bishops, on benches, and the viscounts and barons on others across the house; all according to their order of creation, place, &c.

The commons sit promiscuously, forty members constituting a house; only the speaker has a chair at the upper end; and the clerk and his assistant at a table near him. See SPEAKER.

As to the Manner of debating and passing Bills in Parliament.—To bring a bill into the house, if relief sought by it is of a private nature, it is first necessary to prefer a petition; which must be presented by a member, and usually sets forth the grievance desired to be remedied. This petition, (when founded on facts that may be in their nature disputed) is referred to a committee of members, who examine the matter alleged, and accordingly report it to the house; and then (or otherwise upon the mere petition) leave is given to bring in the bill. In public matters the bill is brought in upon motion made to the house, without any petition at all. Formerly all bills were drawn in the form of petitions, which were entered upon the Parliament Rolls, with the king's answer thereunto subjoined; not in any settled form of words, but as the circumstances of the case required: and at the end of each parliament the judges drew them into the form of a statute, which was entered on the Statute Rolls. In the reign of Henry V., to prevent mistakes and abuses, the statutes were drawn up by the judges before the end of the parliament; and, in the reign of Henry VI., bills in the form of acts, according to the modern custom, were first introduced.

The persons directed to bring in the bill, present it in a competent time to the house, drawn out on paper, with a multitude of blanks, or void spaces, where any thing occurs that is dubious, or necessary to be settled by the parliament itself (such, especially, as the precise date of times, the nature and quantity of penalties, or of any sums of money to be raised); being indeed only the skeleton of the bill. In the house of lords, if the bill begins there, it is (when of a private nature) referred to two of the judges, to examine and report the state of the facts alleged, to see that all necessary parties consent, and to settle all points of technical propriety. This is read a first time, and at a convenient distance a second time; and after each reading the speaker opens to the house the substance of the bill, and puts the question, whether it shall proceed any farther.

The introduction of the bill may be originally opposed, as the bill itself may at either of the readings; and, if the opposition succeeds, the bill must be dropped for that session: as it must also, if opposed with success in any of the subsequent stages.

After the second reading it is committed, that is, referred

to a committee; which is either selected by the house in matters of small importance, or else, upon a bill of consequence, the house resolves itself into a committee of the whole house. A committee of the whole house is composed of every member; and, to form it, the speaker quits the chair (another member being appointed chairman), and may sit and debate as a private member. In these committees the bill is debated clause by clause, amendments made, the blanks filled up, and sometimes the bill entirely new modelled. After it has gone through the committee, the chairman reports it to the house with such amendments as the committee have made; and then the house reconsider the whole bill again, and the question is repeatedly put upon every clause and amendment. When the house have agreed or disagreed to the amendments of the committee, and sometimes added new amendments of their own, the bill is then ordered to be engrossed, or written in a strong gross hand, in one or more long rolls (or presses) of parchment sewed together. When this is finished, it is read a third time, and amendments are sometimes then made to it; and, if a new clause be added, it is done by tacking a separate piece of parchment to the bill, which is called a *rider*. The speaker then again opens the contents; and, holding it up in his hands, puts the question whether the bill shall pass. If this is agreed to, the title to it is then settled; which used to be a general one for all the acts passed in the session, till, in the fifth year of Henry VIII. distinct titles were introduced for each chapter. After this, one of the members is directed to carry it to the lords, and desire their concurrence; who, attended by several more, carries it to the bar of the house of peers, and there delivers it to their speaker, who comes down from his woolack to receive it.

It there passes through the same forms as in the other house (except engrossing, which is already done), and if rejected, no more notice is taken, but it passes *sub silentio*, to prevent unbecoming altercations. But, if it is agreed to, the lords send a message, by two masters in chancery, (or sometimes two of the judges,) that they have agreed to the same: and the bill remains with the lords, if they have made no amendment to it. But if any amendments are made, such amendments are sent down with the bill to receive the concurrence of the commons. If the commons disagree to the amendments, a conference usually follows between members deputed from each house; who for the most part settle and adjust the difference; but, if both houses remain inflexible, the bill is dropped. If the commons agree to the amendments, the bill is sent back to the lords, by one of the members, with a message to acquaint them therewith. The same forms are observed, *mutatis mutandis*, when the bill begins in the house of lords. But, when an act of grace or pardon is passed, it is first signed by his majesty, and then read once only in each of the houses, without any new engrossing or amendment. And when both houses have done with any bill, it always is deposited in the house of peers, to wait the royal assent; except in the case of a money-bill, which, after receiving the concurrence of the lords, is sent back to the house of commons.

The royal assent may be given two ways. 1. In person; when the king comes to the house of peers, in his crown and royal robes, and sending for the commons to the bar, the titles of all the bills that have passed both houses are read; and the king's answer is declared by the clerk of the parliament in Norman-French. If the king consents to a public bill, the clerk usually declares, "*le roy le veut; the king wills it so to be;*" if to a private bill, "*soit fait comme il est desiré; be it as it is desired.*" If the king refuses his assent, it is in the gentle language of "*le roy s'avisera; the king will*

advise upon it." When a money-bill, or bill of supply, is passed, it is carried up and presented to the king by the speaker of the house of commons; and the royal assent is thus expressed, "*le roy remercie ses loyal sujets, accepte leur benevolence, et aussi le veut; the king thanks his loyal subjects, accepts their benevolence, and wills it so to be.*"

In case of an act of grace, which originally proceeds from the crown, and has the royal assent in the first stage of it, the clerk of the parliament thus pronounces the gratitude of the subject; "*les prelates, seigneurs, et commons, en ce present parlement assemblees, au nom de tous vous autres sujets, remercient tres humblement votre majeste, et prient a Dieu vous donner en sante bone vie et longue; the prelates, lords, and commons, in this present parliament assembled, in the name of all your other subjects, most humbly thank your majesty, and pray to God to grant you in health and wealth long to live.*"

2. By the statute 33 Hen. VIII. cap. 21. the king may give his assent, by letters patent, under his great seal, signed with his hand, and notified, in his absence to both houses, assembled together in the high house. And when the bill has received the royal assent, in either of these ways, it is then, and not before, a statute or act of parliament: a copy of which is usually printed at the king's press, for the information of the whole land. See, on this article, Blackst. Com. book i. chap. 2.

PARLIAMENT, *Adjournment of*, is a continuance of the session from one day to another, as the word signifies, which is done by the authority of each house separately, every day, and sometimes for a fortnight or a month together; but the adjournment of one house is no adjournment of the other.

PARLIAMENT, *Dissolution of*, is the civil death of the parliament, which may be effected either by the king's will, expressed in person, or by representation, or by the demise of the crown; in which case it is enacted, by 7 & 8 Will. III. cap. 15. and 6 Anne, cap. 7. that the parliament in being shall continue for six months after the death of any king or queen, unless sooner prorogued or dissolved by the successor; and that if, at the time of the king's death, it stands adjourned or prorogued, it shall assemble immediately; and that, if no parliament is then in being, the members of the last parliament shall assemble, and he again a parliament; or, lastly, by length of time, which by 6 W. & M. cap. 2. was three years; but, by 1 Geo. I. stat. 2. cap. 38, is now seven years; so that the parliament must expire or die a natural death at the end of every seventh year.

PARLIAMENT, *Prorogation of*, is the continuance of it from one session to another. This is done by the royal authority, expressed either by the lord chancellor, in his majesty's presence, or by commission from the crown, or frequently by proclamation. Both houses are necessarily prorogued at the same time: it not being a prorogation of the house of lords or commons, but of the parliament. The difference between a prorogation and an adjournment is obvious; the former puts an end to the session, and then such bills as are only begun, and not perfected, must be resumed *de novo* (if at all) in a subsequent session; whereas, after an adjournment, all things continue in the same state, and may be proceeded on without any fresh commencement.

PARLIAMENT-HOUSE, *Porter of*. See PORTER.

PARLIAMENT, *Rolls of*. See ROLLS.

PARLIAMENT, *Session of*. See SESSION.

PARLIAMENT is sometimes also used for other assemblies beside those of the states of the realm. Thus we read, that the abbot of Croyland was used to call parliaments of his monks, to consult of the affairs of the monastery. And, at this day, an assembly of the two temples, called to consult of their common affairs, is called a parliament.

PARLIAMENTS of France, according to the old constitution, were courts, or assemblies, established by the king to judge of the differences between particular persons, and to pronounce on appeals from sentences given by inferior judges.

There were twelve of these parliaments in France; that of Thoulouse, established in 1302; that of Dijon, in 1476; that of Grenoble, in 1453; that of Rouen, in 1499; that of Rennes, in Bretagne, in 1553; that of Bourdeaux, according to Du-Cange, in 1460; that of Aix, in 1501; that of Metz, in 1633; that of Pau, in Bearn, in 1519; that of Besançon, in 1422; that of Doway, in 1668; and that of Paris, about 1254.

The parliament of Paris was the principal, and that whose jurisdiction was of the greatest extent. This was the chief court of justice throughout the realm. It consisted of eight chambers; the grand chamber, where causes of audience were pleaded; the chamber of written law; the chamber of counsel; the Tournelle criminelle, for judging criminal affairs; the Tournelle civile, in aid of the grand chamber; and three chambers of inquests, where processes were adjudged in writing; besides these, there was also the chamber of vacations, and those of requests.

In 1771, the king thought fit to branch the parliament of Paris into six different parliaments, under the denomination of superior courts, each parliament having similar jurisdiction.

Under their second race of kings, this parliament, like that of England, was the king's council; it gave audience to ambassadors, and consulted of the affairs of war and government.

The king, like our's, at that time presided in them, without being at all master of their resolutions. But, in after-times, their authority was abridged; the kings having reserved the decision of the grand affairs of the public to their own councils; leaving none but private ones to the parliaments.

PARLIAMENT-Heel, in *Sea Language*, the situation of a ship, when she is made to stoop a little to one side, so as to clean the upper part of her bottom on the other side, and to cover it with a new composition; and afterwards to perform the same office on that part of the bottom which was first immersed. See *Boor-Topping*.

PARLIAMENTARIAN is a term used to denote those, who, in the time of the civil war, were attached to the parliament, in opposition to the royalists, devoted to the king.

PARLIAMENTUM INDOCTORUM, a denomination given to a parliament, held at Coventry, 6 Henry VI. whereunto, by special precept to the sheriffs of the several counties, no lawyer, or person skilled in the law, was to be called.

PARLIAMENTUM Infanum, was a parliament held at Oxford, anno 41 Henry III. thus called, say our chronicles, because the lords came with great retinues of armed men to it; and many things were violently transacted therein against the king's prerogative.

PARLIAMENTUM Diabolicum, was a parliament held at Coventry, 38 Henry VI. wherein Edward, earl of March (afterwards king,) and several others, were attainted. The acts passed herein were annulled by the succeeding parliament.

PARLIAMENTUM de la Bande, was a parliament in Edward II.'s time, whereto the barons came armed against the two Spencers, with coloured bands on their sleeves, for distinction.

PARLIE, in *Geography*, a town of Hindoostan, in Guzerat; six miles S. of Pernalla.

PARLOUR, PARLOIR, from the French *parler*, to talk, in nunneries, a little room or closet, where people talk to the nuns, through a kind of grated window.

Anciently there were also parlours in the convents of monks, where the novices used to converse together at the hours of recreation; but there were listening-places over, from whence the superiors could hear every thing they said. Such a one there still subsists in the abbey St. German de Prez.

In the order of Feuillans, the parlour is a little room open on all sides, placed at each end of the dormitory, where the monks talk together, it not being allowed them to speak in the dormitory.

PARMA, among *Antiquaries*, a kind of ancient buckler. Polybius describes the parma as very strong, round, three feet in diameter, and big enough to cover the whole body; yet Servius on the *Æneid*, and even Virgil himself, mention it as a light piece of armour, in comparison of the clypeus, though bigger than the pelta.

PARMA, or "*The Parmesan*," in *Geography*, a duchy of Italy, to which are united the territories of *Placentia* or *Picenza*, and *Guastalla*; which see respectively. This country is bounded on the N. by the river Po, separating it from the Cremonese and the Lodese, on the E. by the duchy of Modena, on the S. by Tuscany and Genoa, and on the W. by Genoa and the Pavese; about 40 miles from N. to S., and from 30 to 48 from E. to W. These conjoined territories were contended by the Lombards, and by the exarchs of Ravenna; and after many revolutions, became subject to the papal see; from the dominion of which they were transferred by pope Paul III. in the year 1545, to his natural son Pietro Aloysius, or Farnese, from whom that family sprung. This family becoming extinct in 1731, the duchies of Parma and Placentia, after some contest, were finally assigned to the Bourbon family in Spain. By the treaty of Luneville in 1801, the duke of Parma was nominated by the emperor and the French republic, to the throne of Tuscany, with the title of king of Etruria, of which he soon after took possession. The population of these duchies is computed at 300,000, and the revenue at 175,000*l*. Parma and Placentia have each of them an university. The soil of these territories is a rich sandy or gravelly loam, producing corn, olives, chestnuts, and various kinds of fruit. The pastures are excellent, and the cheese, called "*Parmesan*," has been long held in high estimation. The farms are small, and agriculture has been ill conducted, irrigation being little practised. The sheep are bad, yielding a wool like hair. The Bourbon family very much neglected the improvement of the country.

PARMA, the capital of the above duchy, is divided by the river of the same name, which rises in the south part of the duchy, and runs into the Po near Viadana, into three parts, that communicate with each other by two bridges. This city was founded by the Etrurians, taken by a tribe of Gauls, called the Boii, and, at length, colonized by the Romans. It is said to have suffered much from the licentious cruelty of Antony; and its sufferings on this occasion are pathetically deplored and immortalized by Cicero, in his 14th Philippic, the last tribute which he paid to Rome and to liberty. During the disastrous period that occurred between the reigns of Theodosius and Charlemagne, it was taken and retaken by the Goths and Romans, the Lombards and Greek exarchs, till it was given by Charlemagne to the holy see; and after a succession of ages and changes, it was at length bestowed by Paul III. on his son, Ottavio Farnese.

Farnese. In this family it remained till its extinction, in the middle of the last century, when it passed to a prince of Spain; and on the death of the last duke, was taken possession of by the French, and is now pining away under the influence of their domination. The city is large, populous, airy and clean, though it cannot boast of any very striking or regular building. It is surrounded by walls, flanked with bastions, and a ditch filled with water. On the south is the citadel, which is a regular pentagon, and reckoned the best in Italy. The roads that lead to Parma are in a line, and the streets are straight and broad, formed by well-built and painted houses, and meet in the centre, constituting a handsome square. The new palace was erected on the ruins of the old, and forms an irregular and huge mass of building. The theatre is represented as one of the most beautiful in Italy, and is said to contain upwards of 12,000 spectators, who, by the structure of the place, are capable of hearing the actor on the stage, without any elevation of voice. Here is also a smaller theatre, for the accommodation of the inhabitants. This city is the see of a bishop, suffragan of Bologna. Its university was founded in 1599, and its academy of sciences was instituted in 1601. It has five collegiate and 30 parish churches, besides the cathedral, many of which contain pictures by Correggio, and other eminent masters, and 40 convents. The cathedral is Saxon, but lined in the interior with Roman architecture: its dome is much admired, on account of Correggio's paintings. The baptistery is an octagon, in the same style with the cathedral, cased with marble, and ornamented with various arches and galleries. The Steccata is the most regular church in Parma, in the form of a Greek cross. The church of the Capuchins is only remarkable for being the burial-place of the celebrated Alexander Farnese. The arts and sciences have by no means been neglected in Parma. An university, two academies, schools of painting, &c. announce the application; and a long catalogue of great names might be produced, to prove the success of the Parmians in every literary pursuit. The dukes have for many years assumed the character of Mecænas, and, by their judicious encouragement, attracted men of talents, from other countries, to their territories. The public walks on the ramparts are very pleasing. The country round is well wooded, and the town and territory of Parma, on the whole, seemed to have been in a flourishing state till the entrance of the French army. Since that fatal period, its prosperity has been on the decline, its government unsettled, and its inhabitants impoverished and discontented. The contributions raised by the French amounted to five millions of French livres; a sum enormous for so small a territory, and equalling two years of its regular income. The chief trade of the place consists in stockings, and some other articles of silk manufacture. The printing press, established by Bodoni in 1765, has been distinguished for beautiful publications. The number of its inhabitants is not accurately ascertained; some reckoning them at 45,000, and others at 37,000; 32 miles S.W. of Mantua. N. lat. 44° 47'. E. long. 27° 52'.

Parma was a town of Gallia Cispadana, and possessed for a long time by the Boii. It appears to have subsisted for a considerable period, when, in 579, the Romans sent hither a colony under the consulates of Q. Fabius Labeo and Marcellus. In the reign of Augustus, this place assumed the appellation of "Colonia Julia Augusta." It suffered much during the wars of Antony.

PARMELIA, in Botany, so called, as Professor Acharius, the author of the name and of the genus, tells us, from *παρμηνη*, a sort of small shield, and *εἰλωτο*, to surround or inclose,

a genus of the natural order of LICHENES. (See that article, sect. 3. n. 16.) The learned writer, whose distribution of this tribe we have explained in that place, has judged it best to exclude the name of *Lichen*, as a generic appellation, retaining it for the whole natural order, which is perhaps the most commodious plan; otherwise, it should have remained with the genus before us, as being the most extensive in species, and the most comprehensive in character, of the whole. It is indeed so miscellaneous in habit, that we cannot but feel favourably disposed to any attempt at dividing it; and yet we can hardly accede to the very great multiplication of genera in Acharius's most recent work, the *Lichenographia universalis*; a book indeed so very scarce in this kingdom at present, that we have not been able to acquire or to study it. *Collema* however is so naturally distinct in habit and appearance, that no doubt can remain of the propriety of its separation. (See its character in the place above cited.) That of *Parmelia*, see Ach. Meth. 153, should therefore stand as follows.

Shields orbicular, horizontal, superficial, somewhat elevated, with a cartilaginous accessory border.

The disk is sometimes concave, oftener nearly flat, or indeed convex and hemispherical when far advanced in age, of a different substance and colour from the border, and without any border, or separate edge, of its own substance, in which last respect it differs from the Acharian genus *Lecidea*. The texture of the disk is tolerably firm, though occupied with innumerable vertical parallel cells, each containing about eight minute seeds, placed one above the other. Its external colour is different in different species, most generally brown or reddish, but always totally unlike that of the border; internally it is paler. By age the disk in many species becomes loosened, falling out, and leaving its border in the shape of a small cup, or rather saucer, as may be seen in *P. conspersa*, Ach. Meth. 205. In *P. subfusca*, 167, see Engl. Bot. t. 2109. a very extraordinary proliferous appearance is occasionally seen in the disk. The writer of this has suspected that, in *subfusca* especially, when impregnation fails, the disk does not acquire its proper colour.

The border is of the same colour and substance with the frond, from which it proceeds, being elevated more or less above the level of that part, and very generally, at least in the more leafy species, attached merely by a central stalk, though its circumference is flat, and clapped, often very closely, to the surface. In the crustaceous kinds the union of the parts is more considerable; in the more filamentous or branched ones it is merely central, by an elongated and obvious stalk. The extreme part of the border is more or less tumid and thick, either smooth or powdery, entire or crenate, rarely fringed or leafy, while the very edge itself is inflexed and even.

The frond is various and of many different shapes and appearances. When crustaceous, leprous, or tartareous, it is either uniform, and limited by a well-marked border, usually blackish; or it is loosely dispersed, without any distinct limitation, frequently in small portions or patches, and then, in many instances, finally disappears by age, leaving the bare and scattered shields, as if growing independently out of the stone or bark. In other cases the frond consists of lobed fragments, assuming a leafy imbricated aspect, and a cartilaginous texture; from which there is an insensible gradation to a truly leafy configuration, which is either membranous or coriaceous, dilated and lobed, or narrow and repeatedly branched, round or compressed, erect, horizontal, or pendulous: in all cases it readily imbibes moisture, and by that means becomes instantly soft, flexible, and

and vegetative, however dry, contracted and brittle before. The colour of the frond is commonly very different in its moist and flourishing state, to what it is when dry; being, in the latter condition usually pale and greyish, but assuming a beautiful green when moistened. Yet there are some species always of the same grey hue, whether wet or dry, which by that very circumstance are well distinguished from others. See *P. stellaris* and *asplasia*, Ach. Meth. 209.

The male fructification of *Parmelia* is supposed, rather than known, to consist of scattered powdery warts, mostly of a lighter colour than the frond, on whose surface or segments they are situated, burbling, as it were, from under the cuticle. They are conspicuous in *P. casta*, see Engl. Bot. t. 1052, and *physodes*, t. 126. There is perhaps much reason to suppose such efflorescences to be of the nature of buds, or *gemmæ*, by which the species may be increased. The great Hedwig however speaks of them, in the example last cited, as clearly anthers. (See his *Theoria*, 124. t. 31, and *Withering*, v. 1. 371. t. 16. f. 86, 87.) In that they are commonly found on a separate plant from the shields, a rare occurrence in this tribe. They are also in the species in question, as well as most others, by far most abundant when the shields, which are unquestionably the female parts of fructification, are sparingly produced; which is rather in favour of the opinion of their being buds. The same opinion is strengthened by a consideration of the plants constituting a supposed genus called *Lepraria*, which are propagated very copiously by such powdery granulations only; and yet a few of its species are known to bear sometimes, though very rarely indeed, proper shields, with the character either of a *Parmelia* or a *Lecidea*; and we are much inclined to presume they may all be capable, in favourable circumstances, of doing so. The parts of the shield, at the period when impregnation, in whatever mode, must take place, are so minute, homogeneous and obscure, that if we still remain in total ignorance of the flowers of Ferns, no wonder we are equally in the dark respecting Lichens.

PARMENALORE, in *Geography*, a town of Hindoostan, in Coimbatore; 15 miles S.W. of Errood.

PARMENIDES, in *Biography*, a celebrated Greek philosopher of the Eleatic sect, who flourished about 500 years before Christ, was a native of Elea, possessed a large patrimony, and lived in much splendour in his earliest years. He was distinguished in civil affairs, and is said to have drawn up for his fellow-citizens some excellent laws, to which their magistrates obliged them annually to swear obedience. He at length withdrew from the concerns of public life to the silence and leisure of the schools. He became the disciple and successor of Xenophanes, and is said to have attended upon the instructions of Anaximander. According to the testimony of Cebes, in his allegorical tale, our philosopher was distinguished as an eminent pattern of virtue. He wrote the doctrine of his school in verses, of which only a few fragments remain. Plato, in the dialogue which he denominated *Parmenides*, professed to represent his tenets, but confounded them with his own. He maintained that philosophy was twofold; that which follows the report of the senses, and that which is according to reason and truth. The former treats of the appearances of sensible objects; the latter considers the abstract nature of things, and inquires into the constitution of the universe. He maintained that the universe is one, improveable, eternal, and of a spherical form; that the earth is spherical, and placed in the centre, being exactly balanced by its distance from the heavens, so that there is no cause why it should

move one way rather than another. Parmenides adhered more closely to the Pythagorean doctrine than Xenophanes, the founder of the Eleatic sect; for while the latter considered the universe as possessing within itself a divine force, the former supposed the deity to be an informing principle, or intellectual fire diffused throughout the universe, but more especially residing in the extreme sphere of the world; on which account, he is metaphorically represented by this philosopher as a crown of light, inclosing within its circumference the celestial orb. Enfield's Hist. Phil.

PARMENIDES' *Philosophy*. See ELEATIC.

PARMENIO, in *Biography*, a distinguished Macedonian commander, who rose to great reputation under king Philip. That monarch is said to have pronounced him the only general he had ever met with. When Alexander invaded Asia, he was accompanied by Parmenio, who, after the victory of Granicus, gave the advice of venturing upon a naval engagement, and offered himself to serve on board the fleet. Alexander, however, regarding the sea as the proper element of the Persians and their allies, would not consent to the hazard. At the battle of Issus, Parmenio had the command of the left wing; and after that important victory, he was dispatched to Damascus, to take possession of the treasures of Darius, left in that city. In the decisive action of Arbela, Parmenio again commanded the left wing of the Macedonian army; while his two sons, Philotas and Nicanor, had separate commands on the right. During the battle he had to sustain the charge of the whole Persian cavalry, and was, at one time, reduced to such danger, that he sent for succour to Alexander, who was victorious in the centre. The prince arrived in time to rescue Parmenio, who thereupon took possession of the enemy's camp, while Alexander continued the pursuit of Darius in person. He next endeavoured, but in vain, to divert Alexander from the frantic design of burning the royal palace of Persepolis. The ruin of Parmenio was occasioned by the indelicacy of his own son Philotas, who, elated by his prince's favour, affected a pomp and splendour which might render him suspected of ambitious views. The discontents of the army, at the Persian manners assumed by Alexander, after the death of Darius, having produced a conspiracy against his life, Philotas, on its detection, was involved in the guilt, or at least in the accusation, and was put to the rack to force a confession. Unable to endure the torture, he named many accomplices, and among the rest his father. His criminality being supposed to be proved, he was put to death; but the life of Parmenio was at last taken away in a safe and treacherous manner. The persons employed in this infamous business, approaching the general as he was walking in his pleasure-grounds, presented him with a letter from the king, and another in which the hand of Philotas was counterfeited; and while he was intent upon reading them, they stabbed him with repeated wounds. His head was then cut off, and sent to Alexander, while his affectionate soldiers mournfully interred his body. Univer. Hist.

PARMENTIER, JOHN, a scientific French navigator, a native of Dieppe, was born in the year 1494. He was intended and educated for mercantile pursuits, but possessing a love of science, and spirit of enterprize, he acquired celebrity among his contemporaries. He was also esteemed as a poet, and wrote verses on different subjects, of which a collection was published in 1531, under the title of "Description nouvelle des Dignités de ce Monde, et de la Dignité de l'Homme, composée en Rithme François, et en Maniere d'Exhortation." This work is now extremely scarce, and very highly prized by collectors of curious and rare books; but it is chiefly valuable, as containing particulars concerning

concerning the author prefixed to it, from which the following is extracted. "From the year 1522 he had applied himself to the science of cosmography, and the study of the wonderful fluctuations of the sea. On these subjects he became profoundly skilled, as he was likewise in the science of astrology. He drew several maps and charts, both spherical and plane, which were of great service to navigators. He was worthy of the esteem of all men of learning, and capable, had his life been prolonged, of reflecting honour on his country, by his great enterprises. He was the first pilot who conducted ships to the coast of Brasil, the first Frenchman who discovered the Indies as far as the island of Sumatra, called Taprobane by the ancient cosmographers. It had been his intention to have proceeded as far as the Moluccas; and he frequently told me, says the editor, Pierre Crignon, that he was determined, after he should have returned to France, to seek a northern passage, and from thence to pursue his discoveries towards the south." This design was frustrated by his death, which took place in 1530, at the island of Sumatra, when he was only 36 years of age.

PARMESAN, *The*, in *Geography*. See PARMA.

PARMESAN is a name given to a cheese, much esteemed among the Italians, and made at Parmesan, whence it is conveyed to various parts of Europe.

The excellent pasture-grounds of this country are watered by the Po; and the cows, from whose milk this cheese is made, yield a great quantity of it. Of this cheese there are three sorts, the *fromaggio di forma*, about two palms in diameter, and seven or eight inches thick; and the *fromaggio di raviolo* and *di ribolini*, which are not so large. This cheese is of a saffron colour, and the best is kept three or four years. See LODESAN.

PARMIGIANO, IL, in *Biography*, was the cognomen of Francesco Mazzuoli, a painter of great and deserved renown, born at Parma in 1504. He was the pupil of his uncles Michele and Filippo, and at the early age of nineteen had attained very considerable celebrity; having made Correggio, who was then living, the object of his imitation. He then went to Rome, and taking with him some of his productions, was introduced by their renown to pope Clement VII. who highly honoured and esteemed him. In Rome he attached himself to the study of Michael Angelo and Raphael; and exhibited the loftiness of his mind, by composing a style for himself from the high qualities of those two great men, in conjunction with what he had learned of Correggio. In Rome, and under the immediate influence of this newly acquired gusto, he painted several pictures, and among them one which was bought by the marquis of Abercorn, of Mr. Dumo in Italy, for 1500*l.*, and resold by him in 1809 to Mr. Davis of Bristol, for 3000 guineas. It represents the Virgin seated in glory with a book in her hand, and the infant standing on the clouds, and leaning against her knee; in front is a figure of St. John kneeling upon one knee, pointing with one hand to the Virgin, and turning his face to the observer; and in the background, asleep, is a figure of St. Jerome, who is supposed to have seen this vision, and from which the picture takes its name. Vafari makes especial mention of it; and says, Parmigiano painted it for Donna Maria Bufolina of Citta di Castello, who intended to place it in the church of St. Salvatore del Lauro; in a chapel near the door. In the execution of it, Parmigiano had nearly lost his life; for notwithstanding the siege of Rome by the Colonnas, he continued painting upon it, and some Germans, intent upon plunder, entered his room while he was so engaged. The splendour of the work, however, fortunately so astonished and delighted them, that

though they spared in no excess, but robbed the palaces and churches of every thing they thought worth having; yet they protected the painter and honoured his abilities. He did not quite complete the picture, and soon after left the city; but not till the soldiers had obliged him to make for them a number of drawings in pen and ink. He was afterwards, in going to see some friends, made a prisoner by other soldiers, from whom he disengaged himself by paying money; and then his uncle, alarmed for his safety, removed him from Rome and sent him back to Parma. This grand picture was safely lodged in the convent of the Frati della Pace, where it remained in the refectory many years, and was then carried by Julio Bufolino to its original destination, the church at Citta di Castello.

In his return to his native place, Parmigiano stopped at Bologna; and there for a while he engaged himself in making those free and elegant etchings, with which the cognoscenti are so enamoured. He also painted several pictures there, and made a great number of drawings, and two portraits of Bonifacio Gozadino and his wife. Among the pictures was a large one for the monks of St. Margaret, of the Virgin, with several saints, which was very highly esteemed by the Caracci, and by Guido was preferred to the St. Cecilia of Raphael. He there also painted a portrait of Charles V. with a figure of fame crowning him with laurel, which he effected after seeing the emperor dining in public several times; and it so gratified his majesty that he wished to have it, but Parmigiano stating that it was not finished, it remained with him, and afterwards passed to the possession of the duke of Mantua.

He at length returned to his native city, and was immediately engaged to paint, in fresco, the vaulted ceiling of the church of Sta. Maria della Steccato; and in the lower part executed six figures; a Moses, three Sybils, and an Adam and Eve. Of which Mr. Barry, in a letter to Mr. Burke, says, "that they exhibit powers which, if fully displayed, might have exceeded either Raphael or M. Angelo." Unfortunately at this time, when Parmigiano ought to have pursued this great work, and have established his fame upon it, he turned aside to the alluring study of alchemy, and wasted his time and his fortune in vain attempts at transmutations; which only prevented him from exercising his abilities in a more certain mode of obtaining not only gold, but also glory. He died at the age of 36 or 7, in 1540-1.

"The ruling features of his style are elegance of form, grace of countenance, contrast in attitude, enchanting chiaroscuro, and blandishments of colour. When these are pure, he is inimitable: but his elegance is often stretched to excessive slenderness, and his grace deformed to affectation."

He was a learned designer: to his depth in design, we must ascribe that freedom of execution, those decided strokes of his pencil, which Albano calls divine, and which add grace to the finish of his pictures: they have not indeed all equal impact of colour, nor equal effect, though some, for the amorè with which they are conducted, have been ascribed to Correggio: such is the Cupid scooping his bow, with the two infants at his feet, one laughing, the other crying, of which, besides that in the Imperial gallery, there are several repetitions. "Such was the delight found in the study of the pictures of Parmigiano, that copies, and excellent ones too, are found all over Italy; and are not unfrequently sold here as originals. The one upon which we have dwelt so minutely above, the dream of St. Jerome, is of so high a class, that it may rank with the Peter Martyr of Titian, the Transfiguration of Raphael, and the St. Jerome of Dominichino. His cousin, Girolamo Mazzuolo, was his friend and pupil, and possessed so much skill in execution, that it is not impossible

possible that many pictures ascribed to Parmigiano are executed by this artist." He was more attached to the style of Correggio than Francisco; and seized its character with great felicity in the Nuptials of St. Catharine, in the church del Carmine. He excelled in perspective; and in the Last Supper in the refectory of S. Giovanni, placed and painted a colonnade with all the illusion of Pozzo. To the most harmonious chiaro-scuro, he added grandeur, variety, vivacity, in fresco. None of his fellow artists equalled him in copiousness, fertility, and execution; and to these perhaps we may ascribe the inequality perceptible in his works.

PARMILLIEU, in *Geography*, a town of France, in the department of the Isere; 24 miles E N E. of Lyons.

PARMONCA, a town of Peru, in the audience of Lima, near the sea; 35 miles N.N.W. of Guaura.

PARNAPIACABA, a river of Brazil, which runs into the Atlantic, S. lat. 24° 12'.

PARNASSA, a town of Hindoostan; 15 miles S.S.E. of Allahabad.

PARNASSIA, in *Botany*, well altered by Tournefort from the old name of Gramen Parnassi, which has been appropriated to this most curious and elegant plant, because it appears really to be what Dioscorides terms the Grass of Parnassus, *αγρυσις ἢ ἐν παρνασσῷ*. Not that it has any thing to do with the grasses, properly so called; but he describes it as "having ivy-like leaves, a white and pleasantly-scented flower, with small not ineffectual seed, five or six roots as thick as the finger, white and soft." This description sufficiently answers to our *Parnassia*, except that we know of no smell in the flowers. Some have taken *Convallaria bifolia* for what Dioscorides intended.—Linn. Gen. 151. Schreb. 204. Willd. Sp. Pl. v. 1. 1516. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 339. Prodr. Fl. Græc. Sibth. v. 1. 210. Ait. Hort. Kew. ed. 2. v. 2. 177. Juss. 245. Tourn. t. 127. Lamarck Illustr. t. 216. Gærtn. t. 60.—Class and order, *Pentandria Tetragynia*. Nat. Ord. *Campanaceæ*, Linn. MSS. *Capparides*, Juss.

Gen. Ch. *Cal.* Perianth inferior, in five, deep, elliptic-oblong, spreading, permanent segments. *Cor.* Petals five, roundish, striated, concave, spreading. Nectaries five, opposite to the petals, each a roundish or oblong fleshy scale, fringed with from three to thirteen erect marginal stalks, bearing every one a small globe, shorter than the petals. *Stam.* Filaments five, awl-shaped, the length of the nectaries, separately inflexed for a time over the germen; anthers incumbent, depressed. *Pist.* Germen superior, ovate, large, sessile; style none, but an aperture in its place; stigmas four, obtuse, permanent, enlarged in the fruit. *Peric.* Capsule ovate, somewhat quadrangular, of one cell and four valves, the partitions from the centre of each valve, each bearing a furrowed parallel receptacle. *Seeds* several, oblong, ascending.

Eff. Ch. Calyx in five deep segments. Petals five. Nectaries five, fringed with stalked globules. Capsule of four valves, with many seeds.

1. *P. palustris*. Common Grass of Parnassus. Linn. Sp. Pl. 391. Engl. Bot. t. 82. Fl. Dan. t. 584. Mill. Illustr. t. 15. Sm. Intr. t. 13. f. 175. Dickf. H. Sicc. fasc. 7. 10. Ehrh. Pl. Off. 133. (Gramen Parnassi; Ger. em. 840.)—Leaves heart-shaped. Petals sessile, emarginate. Nectaries with numerous segments.—Native of boggy pastures throughout Europe, flowering in autumn. Dr. Sibthorp gathered it on the Bithynian Olympus, and there is every reason to believe it may grow on Parnassus, and other Grecian hills; whereas *Convallaria bifolia*, which some botanists suppose to be what Dioscorides meant, is not known to be a Grecian plant, but is rather confined to the northern parts of

Europe. The root of *P. palustris* is perennial, cylindrical and fleshy, throwing out many long fibres. *Stems* erect, near a span high, simple, angular, twisted, smooth, bearing one sessile leaf, and one flower. *Leaves* heart-shaped, entire, ribbed, smooth; the radical ones numerous, on stalks thrice their own length. *Flower* terminal, above an inch wide, white and singularly elegant. *Petals* marked with many parallel pellucid lines. *Nectaries* wedge-shaped, each bearing about thirteen globe-tipped bristles; the globes, like the anthers, pale yellow. The *stamens* are bent successively over the *stigmas* to impregnate them, retiring subsequently, as in *Saxifraga* and *Ruta*. Afterwards the *stigmas* are brought nearer together, closing the aperture of the *germen*; but the insertion of the *seeds* proves that the impregnation must take place through the usual parts, and not by the aperture.

2. *P. caroliniana*. Carolina Grass of Parnassus. Michaux Boreal. Amer. v. 1. 184. Ait. n. 2. Sims in Curt. Mag. t. 1459.—Leaves almost orbicular. Petals nearly sessile. Nectaries deeply three-cleft.—Discovered by M. Bosc on bogs in North Carolina. It was sent to Kew garden in 1802 (not 1782) by the late Mr. Masson, and is hardy in our climate, flowering in autumn. This has altogether the habit of the preceding, but is somewhat larger. The *leaves* are more orbicular. *Petals* more elliptical, entire, not emarginate, the lines green and very numerous, the whole of the petals of a greenish cast. *Nectaries* remarkably different, being deeply divided into three awl-shaped segments only, with a yellow ball upon each point. Mr. Aiton mentions this species as flowering in May and June; Dr. Sims from July to September.

3. *P. afarifolia*. Kidney-leaved Grass of Parnassus. Venten. Jard. de la Malmaison. t. 39.—Leaves kidney-shaped. Petals with claws. Nectaries oblong, with three terminal segments.—Native of bogs in North America, flowering in the latter part of summer. M. Ventenat described it from the collection at Malmaison. This differs from both the foregoing in having shorter or kidney-shaped *leaves*; *petals* furnished with considerable claws; *nectaries* of an elongated and linear form, divided at the upper part only, into three bristle-like segments, tipped with darker-coloured globules. The *petals* moreover seem to be smaller, and more rounded, than in the *caroliniana*; entire, and not, as in the *palustris*, emarginate. We have not heard of this, any more than the following, in the English gardens.

4. *P. fimbriata*. Fringe-flowered Grass of Parnassus. König in Ann. of Bot. v. 1. 391.—Leaves kidney-shaped. Petals fringed at the lower part, with entire claws. Nectaries palmate, with numerous segments.—Gathered by Mr. Archibald Menzies on mountains on the north-west coast of America. We are indebted to him for fine specimens, by which this species appears to agree with the last in habit, but the *flowers* are essentially different. The claws of the *petals* are smooth and entire, but the base of each petal itself is copiously fringed with fine long capillary segments. The *nectaries* are palmate, mostly resembling those of the first species, which they seem to approach in their number of segments, but those segments are of a much shorter proportion. The stem *leaf* is much nearer the flower than the root; the radical ones are remarkably hollowed out at their base, close to the lateral ribs, which are connected with one another by a common base, like the divisions of a pedate leaf, and have a very elegant appearance. The same thing is seen, though less remarkably, in *Aristolochia Clematitis*.

PARNASSUS, in *Ancient Geography* and *Mythology*, a mountain of Greece, in the Phocide, consecrated by the poets to the Muses, thence called Parnassides, to Apollo and to Bacchus. It was situated to the S.E. of the Crif-

fean gulf, and N.W. of the river Cephus. On this hill, though for the most part sterile, there were groves and small villages adapted to excite and inflame the poetic genius. It is described as having two summits, one called Hyampea, the other Phitorea, between which arises the Cæstalian fountain. The Greeks call this mountain Licaoura.

PARNASSUS was also a town of Asia, in Galatia, upon the route from Cæsarea to Ancyra, between Aspona and Nyssa, according to the Itinerary of Antonine.

PARNEL, in *Geography*, a town of Hindoostan, in Dowlatabad; 15 miles S.W. of Amednagur.

PARNELL, THOMAS, in *Biography*, an English poet, descended from an ancient family in Cheshire, was born at Dublin in the year 1679, and received his school education in that city, after which he was transferred to the college. He was admitted to the degree of M. A. in 1700, took deacon's orders in the same year, and was ordained priest three years afterwards. In 1705 he was presented to the archdeaconry of Clogher, and about the same time was married to a lady of great beauty and merit. From this period he began to make frequent excursions to England, in which the pleasanter part of his life was spent. He connected himself with the whigs, who were at that time in power, and was familiar with their most distinguished men of letters, as Addison, Congreve, and Steele. Towards the close of queen Anne's reign, Parnell, influenced, it was thought, by Swift, deserted his former friends, and joined in close union with that celebrated wit, and his associates, Pope, Gay, and Arbuthnot. Swift introduced him to lord-treasurer Harley, and with a dictatorial air insisted upon the treasurer going with his staff in his hand into the anti-chamber, where Parnell was waiting to welcome him. Parnell, however, never had any claim to a high rank in literature, nor was it possible he could render his friends much political service. He was a pleasant good tempered man, attached to his particular associates, and so much addicted to society, that he preferred what was indifferent to solitude. He was, at one period, an assiduous preacher in the London pulpits, hoping to rise into notice by the popularity of his talents, but the complete change in the administration by the death of queen Anne entirely destroyed his brilliant prospects in the church. By means of Swift's recommendation of him to the notice of archbishop King, he obtained a prebend and a valuable living. In 1712 he received a most severe shock, by the death of his beloved wife, from which he never recovered. The loss is said to have had such an effect upon his spirits, as to lead him into those habits of intemperance in wine which shortened his life, and his biographer, Dr. Goldsmith, represents him, in some measure, a martyr to conjugal fidelity. He died at Chelster, on his way to Ireland, in July 1717, in the 38th year of his age, and was buried, without any monumental record, in Trinity-church in that city. He was author of several pieces both in prose and verse. He wrote the *Life of Homer*, prefixed to Pope's *Iliad*, which, however, on account of the stiffness of the style, cost that poet much labour in the correction. It is as a poet that he is now exclusively known and valued. After his death, Pope made a selection of such of his pieces as he thought worth preserving, and published them in one volume octavo. They have since made a part of the body of approved English poetry. They are remarkable for ease, sprightliness, fancy, clearness of language, and melody of versification. Though not ranking among the noblest and most finished productions of the British muse, they claim a place among the most pleasing. Their sentiments are elegant, and their morality very pure. A volume of posthumous pieces was printed at

Dublin in 1758, the contents of which have been since added to the former in the collections of English poets. Dr. Johnson has thought it unnecessary to enquire into their authenticity, or canvass their merits: he expressly limits his commendations to the pieces published by Pope.

PARNES, in *Ancient Geography*, a mountain of Greece, in Attica, on which were a statue of Jupiter Parnetian in bronze, another of Jupiter and Serrelé, and another altar on which the adjacent inhabitants sacrificed to Jupiter, under the appellations of the *beneficent* and *rainy*, or *pluvius*. This mountain abounded with bears and wild boars.

PARNIPA, in *Geography*, a river of Brasil, which runs into the Atlantic, S. lat. 18° 10'.

PARNON, in *Ancient Geography*, a lofty mountain of the Argolide, on which were placed the Hermæan statues of Mercury, which, in the time of Pausanias, indicated the limits of Laconia, and of the territory of the Tægeates, a people of Arcadia.

PARNOPS, in *Natural History*, the name of a species of wasp, found very frequently in vineyards, and among the wine presses, especially in hot countries. It is distinguished from all the other wasps by the roundness of its body, which is not slender or flattened in the common way, but round and tumid.

PARO, or PAROGONG, or *Kinjipo*, in *Geography*, a town, castle, and palace, as well as valley of Bootan. The castle stands near the base of a very high mountain, in the form of an oblong square, fenced by walls and parapets, having one entrance over a bridge, that may be easily removed, and guarded by stone buildings, placed as a kind of out-post, in a triangular position upon the side of the mountain. This is the residence of the governor, and famous for the manufacture of idol deities and forging of arms, particularly of swords and daggers, and the bars of arrows. Paro boasts the only market in Bootan; and appears to be much frequented. The valley exceeds that of Tassifudon by almost a mile in width: it lies nearly N.W. and S.E., and the river intersects it irregularly, as it pursues its winding course. Paro lies 12 miles S.W. of Tassifudon. N. lat. 27° 43'. E. long. 89° 32'. Turner's Tibet.

PARO, a small island near the coast of Nicaragua, in Salinas bay. N. lat. 10° 3'. W. long. 85° 36'.

PARO *Hotun*, a town of Chinese Tartary; 288 miles N.N.E. of Peking. N. lat. 44° 2'. E. long. 118° 47'.

PAROCHETEUSIS, from *παρεα* and *οχησις*, from *οχησις*, a canal, a term used by Hippocrates, to express a derivation of the humours from one part, in order to the evacuating them by another not far distant. This is often a very happy turn for the cure of a disease.

PAROCHIAL, something belonging to a parish.

Every church is either cathedral, collegiate, or parochial. Cathedral is where there is a bishop's see, or seat, called *cathedra*. Collegiate consists either of regular clerks, professing some religious order; or of a dean and chapter. Parochial church is that instituted for the performing of divine service to the people who dwell within a certain compass of ground. See PARISH and EXTRA-PAROCHIAL.

PAROCHUS, among the Romans, one who provided mules, tents, and carriages, with all other necessaries, for the provincial magistrates in their journeys, as also for ambassadors. For, in the early times of the republic, they had their charges borne by the public, that the allies or provincials might not be burthened.

PARODICAL DEGREES, in an equation, the several regular terms in the quadratic, cubic, biquadratic, or other equation, the indices of whose powers ascend or descend orderly in an arithmetical progression.

Thus

Thus $Z^3 + Z^2M + Z^1r = S$ is a cubical equation where no term is wanting, but having all its parodic degrees, the indices of the terms regularly descending thus, 3, 2, 1, 0. Harris.

PARODY, PARODIA, formed from *παρῶς*, and *ὁδός*, *via*, *way*, as being trite, or passing among the people, a popular maxim, adage, or proverb.

PARODY, *παρωδία*, is also a poetical pleasantry, consisting in applying the verses written on one subject, by way of ridicule, to another; or in turning a serious work into burlesque, by affecting to observe, as nearly as possible, the same rhymes, words, or cadences.

The parody was first set on foot by the Greeks; from whom we borrow the name. It comes near to what some of our late writers call *travestly*.

Others have more accurately distinguished between a parody and burlesque: and they observe, that the change of a single word may parody a verse; or of a single letter a word. Thus, in the last case, Cato exposed the inconstant disposition of Marcus Fulvius Nobilior, by changing *Nobilior* into *Mobilior*.

Another kind of parody consists in the mere application of some known verse, or part of a verse, of a writer, without making any change in it, with a view to expose it.

A fourth instance is that of writing verses in the taste and style of authors, little approved.

The rules of parody regard the choice of a subject, and the manner of treating it. The subject should be a known and celebrated work: as to the manner, it should be by an exact imitation, and an intermixture of good-natured pleasantry. Mem. de l'Acad. Belles Lettres, tom. viii. p. 39. &c.

The French term it parodying an instrumental air when it is made vocal, by writing or adjusting words to it. In good compositions, the melody is made for the words; but in parodying an air, the words are set to the melody. In ballads, and songs of many stanzas to the same air, Rousseau observes, that all but the first are parodies, which is easily discovered by the liberties taken with the rhythm by the singers, and the want of musical knowledge in the poet.

PARCEMIA, *παρκεμία*, formed from *παρῶς* and *ὁμίον*, *way*; *quasi*, *παρὰ ὁμίον*, *justa viam*; i. e. *tritum*, a proverb; which see.

PAROL, PAROLE, in *Law*, is sometimes used in ancient writers for a plea in court.

PAROL *Conveyances*, are such as were formerly, in many instances, made by parol, or word of mouth only, without writing; but this occasioning a variety of frauds, the statute 29 Car. II. c. 3. enacts, that no lease estate or interest in lands, tenements, or hereditaments, made by livery of seisin, or by parol only (except leases, not exceeding three years from the making, and whereon the reserved rent is at least two-thirds of the real value,) shall be looked upon as of greater force than a lease or estate at will: nor shall any assignment, grant, or surrender of any interest in any freehold hereditaments be valid; unless in both cases the same be put in writing, and signed by the party granting, or his agent lawfully authorized, in writing.

PAROL *Demurrer*, is a privilege allowed to an infant who is sued concerning lands, which came to him by descent: and the court thereupon will give judgment, *Quod loquela predicta remaneat quousque*, the infant comes to the age of twenty-one years. And where the age is granted on parol demurrer, the writ doth not abate, but the plea is put *sine die*, until the infant is of full age; and then there shall be a resummons.

The granting of a parol demurrer is in favour of an in-

fant, and for his benefit, that he may not be prejudiced in his right, for want of well knowing his estate, &c. In many real actions, brought by or against an infant, under the age of twenty-one years, and also in actions of debt brought against him, as heir to any deceased ancestor, either party may suggest the nonage of the infant, and pray that the proceedings may be deferred till his full age: or (in our legal phrase,) that the infant may have his age, and that the *parol may demur*, that is, that the pleadings may be staid: and then they shall not proceed till his full age, unless it be apparent that he cannot be prejudiced thereby. (Finch. l. 360.) But by the statutes of Westm. 1. 3 Edw. I. c. 46. and of Gloucester 6 Edw. I. c. 2. in writs of entry *sur disseisin* in some particular cases, and in actions auncestrel brought by an infant, the parol shall not demur: otherwise he might be deforced of his whole property, and even want a maintenance till he came of age. So likewise in a writ of dower the heir shall not have his age; for it is necessary that the widow's claim be immediately determined, else she may want a present subsistence. (1 Roll. Abr. 137.) Nor shall an infant patron have it in a *quare impedit* (ibid. 138.), since the law holds it necessary and expedient, that the church be immediately filled.

PAROL *Evidence*. See EVIDENCE.

PAROL *Lease*, or *per Parol*, is a lease by word of mouth; thus called to distinguish it from one in writing. See LEASE.

PAROL *Pleadings*. See PLEADING.

PAROLE, in *War*, &c. When a prisoner of war is allowed to go into his own country, or to his own party, upon his word and promise to return at a time appointed, if not exchanged, he is said to be upon parole, i. e. upon his word.

PAROLE denotes also a word given out every day in orders by the commanding officer both in camp and garrison, in order to know friends from enemies.

PAROLE, *Pasi*. See PASS-PAROLE.

PAROLI, in *Gaming*, the double of what was laid at stake, before. Hence to offer the paroli, &c.

PAROLLES, Fr. the words of a song, an opera scene, or a cantata.

PARONE, in *Geography*, a town of Hindoostan, in the country of Nays; 32 miles S. of Calicut.

PARONOMASIA, *παρωνομασία*, formed from *παρῶς*, *near*, and *ὄνομα*, *name*, q. d. proximity or resemblance of two names, in *Rhetoric*, a pun, or figure, whereby words nearly alike in sound, but of very different senses, are affectedly or designedly used.

As, not *friends* but *fiends* were here. So Tully to Antony, *cum in gremio mimarum mentem & mentum deponeres*: and to Atticus, *consul ipse parvo animo & pravo, facie magis quam facitiis ridiculus*. And that of P. Chryfologus, *monachorum cellula jam non eremiticæ sed aromaticæ*. And, in another place, *hoc agant in cellis quod angeli in cælis*.

Among the Greeks the paronomasia was very familiar. Thus Herodotus, *παθημαίω, μαθημαίω, quæ nocent, docent*. And thus that inscription of Apollodorus, a celebrated painter, on one of his pieces.

Μομησέται τις μάλλον, η μιμησείται.

“It will be easier to deride, than to imitate.”

PARONYCHIA, in *Botany*, a name that has been applied to several plants, according as commentators were pleased to conjecture one or other of them to be the *παρωνυχία* of Dioscorides, a point which nobody could ascertain. He describes it as “a diminutive shrub, growing in stony places, and resembling purslane, but of more humble growth, though

the leaves are larger. The whole plant bruised is a remedy for whitlows and scald-heads." Matthiolus supposed the Wall-rue, *Asplenium Ruta-muraria*, to be what Dioscorides intended; but he cites other botanists who have thought *Mollugo tetraphylla* to be the plant in question; see Matth. Valgr. v. 2. 388, 389. Dodonæus, Lobel, and Gerarde took *Saxifraga iridiphytes* to be the true *Paronychia*. Clusius has called a species of *Illecebrum* by the name of *Paronychia hispanica*, and hence, rather by accident than for any particular reason, Linnæus has denominated that plant *Illecebrum Paronychia*. The most prevalent opinion has been, that some plant of the class *Tetradynamia* was intended by Dioscorides; though it is difficult to guess why this idea was adopted. Hence however the name of Whitlow-grass has remained with our *Draba verna*, which is reckoned, by several authors, one sort of *Paronychia* at least; and hence that English name has been extended to all the British species of *Draba*.

Tournefort has a genus under the name of *Paronychia*, of which the above-mentioned *Illecebrum* is his first species; see his t. 288. Gærtner follows him, v. 2. 218. t. 128, saying that amongst all the species of *Illecebrum* which he has met with, the *verticillatum* only answers to the Linnæan character, the rest belonging to *Achyranthes*, *Celsia*, or this genus *Paronychia*, either by reason of their stamens being united at the base, or the capsules destitute of valves, or splitting into two hemispheres. See ILLECEBRUM.

PARONYCHIA, from *παρρη* and *ονχ*, the nail, an abscess towards the extremity of the finger, more commonly known by the name of whitlow. See WHITLOW.

PARONYMA, in *Grammar*, are words which have some affinity in their etymology.

PAROPAMISUS, in *Ancient Geography*, a province of India, the eastern limit of which, in Alexander's arrangement of boundaries, was the river Cophenes. According to the ideas of Ptolemy it lay between the countries which the moderns name Khorasan and Cabul; and answers to the tract between Herat and Cabul. Alexandria was regarded as the capital. This province was separated from Bactria by the chain of mountains called "Paropamisus." See GAUR.

PARORCHIDIUM, from *παρρη* and *ορχις*, the testicle, the case in which the testicles do not descend into the scrotum, but remain within the ring of the external oblique muscle, or pass no farther than the groin. A little before birth, these bodies usually descend into the scrotum; but it sometimes happens that this occurrence is retarded by causes, with which we are not satisfactorily acquainted, and, in particular individuals, the testicles even continue within the abdomen during life. Mr. Pott remarks, that he knows not of any particular inconvenience arising from the detention of a testicle within the cavity of the belly; but its lodging in the groin exposes it to be hurt by accidents. When hurt, it may be mistaken for a different disease, and occasion very improper treatment. Besides these considerations, he adds, that there is no kind of disease to which the testicle is liable in its natural situation; but what may also affect it in any, or all its unnatural ones. In the first case, related by Mr. Pott, a testicle being detained in the groin of a young healthy seaman, who hurt the part by hitting it against a piece of timber, the tumour became extremely painful, and was mistaken for a bubonocoele, from which it might have been more readily distinguished by the following circumstances, had not the extreme tenderness of the injured testicle prevented any examination by the touch; and the very hard swelling of the scrotum precluded any certainty of a testicle being there, or not. Mr. Pott observes, that the tumour in the groin did not, like the bubonocoele, point obliquely from the ilium to-

wards the pubes, but lay across the groin, and when the scrotum became soft, no testicle could be felt; two striking circumstances to determine the nature of the case. In the earlier part of this young man's life, the detained testicle had been mistaken for a rupture, and a truss had been applied to it. In the second case, the testicle was detained in the groin; and the patient was also advised to wear a truss, which he could not bear from the pain it occasioned. At last, when the patient was infected with a gonorrhœa, this detained testicle inflamed, forming a hernia humoralis, unfortunately mistaken for a bubo. The tumour, however, was moveable, and the scrotum on that side contained no testicle; two circumstances of importance in the diagnosis. Each patient was cured by the remedies for inflammation of the testicles in their usual situation.

PAROS, in *Ancient and Modern Geography*, an island in the Grecian archipelago, and one of those anciently called "Cyclades," and situated S. of Delos, N. of Ios and Sicinos, W. of Naxos and very near it, and E. of that of Oliaros or Antiparos, from which latter it is separated by a narrow channel. It was known by various names among the ancients; it was called Minoa, because it was conquered by Minos, the renowned king of Crete; before that time, it was denominated Pactia; and since it has repeatedly changed its name, till it took, and at last retained, that of Paros, either from the name of the son of Jason, the argonaut, or of a certain Arcadian, son of Parrhasius. Although it was of small extent, not exceeding 36 miles in circumference, it formerly prided itself on its power and riches, which gave it great influence on the condition of the neighbouring islands. For these it was indebted to the activity of its commerce, and the culture of the arts; its excellent harbours were favourable to navigation and trade, and its quarries of beautiful marble inspired a taste for the arts, of which Phidias and Praxiteles, who were born in this island, eminently availed themselves. We may add that the valour of its inhabitants for a long time maintained its security and its liberty. The Parians, in the time of their prosperity, joined Darius in his expedition against Greece, and assisted him with a considerable squadron; but after the victory of Miltiades and Marathon, they were reduced to great straits by that general. After the battle of Salamis, Themistocles subjected them to Athens, and exacted from them large contributions by way of punishment for the succours they had given to the Persians. From the dominion of the Ptolemies of Egypt, to which the Cyclades were constrained to submit, Paros reverted to that of the Athenians, till their conquerors were expelled by Mithridates the Great. But when this prince was forced to submit to Sylla, Lucullus, and Pompey, Paros and the other Cyclades were reduced into a province by the Romans, together with Lydia, Phrygia, and Caria. Its population was considerable when it was subjected to the Ottoman empire by Barbarossa; but since that epoch it has suffered so much by the pillage of the Turks, by the despotism of the government, and by the stay which the squadron of the captain-pacha makes there every year; that its inhabitants have imperceptibly disappeared, and that at this day it presents scarcely any thing but uncultivated fields and villages partly destroyed. Its quarries of beautiful marble are abandoned and partly filled up with rubbish; so that the descendants of its celebrated artists, whom misery and slavery have degraded, are no longer acquainted with an art which constituted the glory of their country. At the beginning of the last century, the number of its inhabitants was estimated at 6000; but at the present day they are supposed not to exceed 2000. The European consuls have long since withdrawn from it; the Catholics

tholics have fled; and the Greeks who remain, idle and wretched, find themselves exposed every year to the oppression of the officers of the captain-pacha's Squadron, to the sword of the sailors, and to the rapacity of all. Although its extent is not so considerable as that of Naxos, it has in proportion a much greater quantity of lands fit for culture. Its mountains are less elevated, its rising grounds less arid, and its plains would be as fertile, if they were as well watered. A small town called "Paréchia" has replaced the ancient city of Paros, on the W. coast of the island, facing Antiparos; it presents no idea of it, except it be by the beautiful ruins, which are employed, without taste, in its construction. Similar fragments of magnificent monuments cover, in an useless manner, almost the whole territory of the island, and in those deserted remains, art would still discover objects worthy of its admiration. Off "Paréchia" the sea forms a bight, and a harbour whose entrance is difficult, on account of the shoals that obstruct it on the opposite coast. The harbour of Naussa, situated to the north, is one of the finest and most spacious in the archipelago. Here are still visible the batteries which the Russians had erected for defending its entrance, when, masters of the archipelago in their war before the last with the Turks, they had made Paros the depôt of their forces. In autumn this harbour is insalubrious, and also towards the end of the summer, on account of some marshes which are situated at the head of it. The Russian army suffered from them to such a degree, that it was obliged to quit the place, after having lost a great number of soldiers and sailors. There are three harbours on the E. side of the island; the first, called Port Santa Maria, towards the N. point, is sheltered by some islands from winds from the N. and S.; but it is open to the N.E., which prevents ships from frequenting it in winter. The harbour of Marmora lies in the middle. Near it is seen Fort San Antonio, in which Venieri, prince of the island, sustained for a long time all the efforts of Barbarossa. He gave up this important post only because the garrison were in want of every thing, and perishing with thirst and hunger. The harbour of Trio lies lower down, and it is, like the first, sheltered by some islands, but open to southerly winds. Here the captain-pacha remains at anchor every year upwards of a month, till the return of the galleys and small vessels which he dispatches to the neighbouring islands, in order to collect the impost to which they are subject. There is only one harbour to the westward, at the head of which the principal town, now a wretched village, is built. Vessels of burden anchor without, under shelter of some islets, as well as in the narrow channel that separates Paros from Antiparos. Marpefus, situated to the westward of the harbour of Marmora, is the most lofty mountain in the island; and it is this that furnished more particularly the marble for which Paros was so celebrated. Near an ancient quarry, about four miles from Paréchia, is still to be seen a basso-relievo, mentioned by Tournefort, cut in the rock, and containing 29 figures of nymphs and satyrs, dancing a kind of carol. The most valuable monuments of antiquity now extant, called the Oxford or Arundelian marbles, were constructed by a native of this island, whose name is unknown, but who, according to Usher, lived in the third century before the Christian era. (See *PARIAN Marble*.) The inhabitants of Paros and Antiparos supply themselves from the produce of the islands with wheat, barley, wine, sesamum, and some legumes. Cotton is the most considerable production, and the only one that enables the inhabitants to pay their impost, and to procure for themselves such commodities as they need. These two islands pay an impost somewhat more than 8000 piastres. Archi-

lochus the fatirist, was born at Paros, about 720 years B.C. N. lat. $37^{\circ} 4'$. E. long. $25^{\circ} 18'$.

PAROTID GLAND, *Parotis*, in *Anatomy*, from *παρω*, near, and *ως*, the ear, the largest of the salivary glands, situated in front of the ear. See *DEGLUTITION*.

PAROTID Duct, *Wounds and Fistule of*. See *WOUNDS of the FACE*, and *SALIVARY FISTULE*.

PAROTIDES, in *Medicine*; signifies the inflamed and tumid state of the parotid glands. An inflammation of these glands often occurs in persons of scrofulous constitution, without any very obvious exciting cause; but more commonly they are inflamed in consequence of irritation from the absorption of acrid matter, as in the case of excoriations about the face and ears, of scald head, &c.; or from sympathy with inflamed gums, or tooth-ache, especially in the lower jaw; or, lastly, from an extension of inflammation of the throat to them, as in the case of *Mumps*, or *CYNANCHE parotidæa*; which see. In scrofulous or debilitated habits, inflammation and suppuration of the parotids, as well as of other glands, are liable to occur at the close of acute fevers, of which they appear to be sometimes *critical*; but in other instances, especially when they follow severe attacks of measles, or small-pox, they are often extremely tedious in their progress, and difficult of cure, and seem to be indicative of a cachectic condition, left by these fevers. See *SCROFULA*.

PAROTIS, from *παρω* and *ως*, the ear, in *Surgery*, the parotid gland: also an inflammation, or abscess, of this part.

PAROXYSM, *παροξυσμος*, in *Medicine*, is the *fit*, *attack*, or *exacerbation* of a disease, that occurs at intervals, or has decided remissions or intermissions. It is applicable to all febrile, spasmodic, convulsive, painful, or otherwise violent diseases, whether the periods of remission be regular or irregular. Thus we speak of a paroxysm of ague, of gout, of colic, of epilepsy, of insanity, &c.

PARPAJAH, in *Geography*, a town on the N.E. coast of the island of Sumatra, on the river Camfer. N. lat. $0^{\circ} 15'$. W. long. $102^{\circ} 45'$.

PARPARSARAT, an island in the straits of Malacca, near the coast of Sumatra, about 50 miles in circumference. N. lat. $1^{\circ} 21'$. E. long. $102^{\circ} 15'$.

PARPOOLY, a town of Hindoostan, in Concan; 28 miles N.N.E. of Goa.

PARPOUR, a town of Bengal; 70 miles N.W. of Midnapour.—Also, a town of Bengal; 8 miles N. of Curuckpour.

PARR, THOMAS, in *Biography*, mentioned in this work on account of the great age to which he attained, a husbandman in Shropshire, was born about the year 1483. At the age of 120 he married a second wife, by whom he had a child. In the year 1635, he was brought to London by lord Arundel, and introduced at court to king Charles I. as a prodigy; but the change of air, and the new mode of living to which he was necessarily subject, occasioned his death in the same year.

PARRA, in *Geography*, a town of Persia, in the province of Segestán; 60 miles N. of Zareng.

PARRA, the Jacana, in *Ornithology*, a genus of birds of the order Grallæ. The generic character is; bill tapering somewhat obtuse; nostrils oval, in the middle of the bill; front covered with lobate caruncles; the wings are spinous. Sixteen species are enumerated by Gmelin, which are as follow.

Species.

PARRA.

Species.

DOMINICA, or St. Domingo Jacana; so called from its being found in that island, as also in the island whence it derives its specific name, and in almost all the warm parts of America. It is characterised by yellow and moderate claws. The bill is yellow; the caruncle lax, and of a pale yellow colour; the head and body above are of a pale yellow, beneath it is ochry, inclining to rosy.

LUDOVICIANA; Louisiana Jacana. The bill and caruncle are tawny; the crown is black; body above is grey-brown, beneath the colour of ochre. It is about eleven inches long, and is found in the country whence it takes its name. The quill-feathers are black, mixed with a little grey; the tail is of a pale yellow, tipped with black; the legs are red; claws are black.

CAYANENSIS; Cayenne Jacana. Legs reddish; hind-head brown, with a blackish crest. It inhabits Cayenne, feeds on insects, and is about eight inches and a half in length. The bill is red, tipped with black; front and chin black; middle of the crown cinereous; breast with a broad black band; belly and vent white; back greenish-purple; wings white without; tail from the base to the middle white, the rest black, the tip edged with white.

GOENSIS; Goa Jacana. Caruncle red; legs yellow; head, neck, wings, and middle of the tail black; body beneath white. It is found in or near Goa; and is about thirteen inches long. The bill is dusky; from the hind part of the eye a black streak runs through the sides of the neck as far as the breast; the back and wing-coverts reddish-brown, the greater ones white; the tail is white at the base, and tipped with brown.

SENEGALLA; Senegal Jacana. Claws moderately long, and the legs are red. It is found, as its name imports, near Senegal, and is twelve inches long. The bill is of a yellowish-green, tipped with black; the front is white; caruncle lax, and of a pale yellow; chin and throat black; lower part of the belly, tail-coverts, and greater wing-coverts, whitish; quill-feathers black, tipped with white. At the bend of the wings is a black spur: the tail, from the base to the middle, is whitish, the rest black, tipped with reddish; the rest of the body and head is of a grey-brown.

CHILENSIS; Chile Jacana. Claws moderately long; legs brown; hind-head sub-crested. It inhabits Chili, and is the size of a jay, but with longer legs. It feeds on worms and insects, is noisy, and defends itself by the spurs on its wings; it builds in the grass, and lays four tawny eggs, which are speckled with black. The bill is conical, and about two inches long, a little curved at the tip; the irides are yellowish; caruncle two-lobed and red; the neck, back, and fore-part of the wings are violet; throat and breast black; wings and a short tail brown; spurs on the wings yellowish, conical, bony, and about half an inch long.

JACANA; Chestnut Jacana. In this species the hind claws are very long; the legs are greenish. It inhabits the watery places in South America, and is ten inches long. The bill is about an inch and a quarter long, and is of an orange-colour; and on the forehead is a membranous flap, half an inch long, and nearly as broad. On each side of the head also is another of the same kind, about a quarter of an inch broad, and both together they furround the base of the bill. The head, throat, neck, breast, and under parts, are black; and sometimes mixed with white. The birds of this species are chiefly found in Brazil, Guiana, and Surinam; but they are not at all uncommon at St.

Domingo, where they frequent the marshy places, the sides of ponds and streams, and wade up to the thighs in water. They are also generally seen in pairs, and, when separated, call each other continually till they join again. They are very shy, and most common in the rainy seasons in May and November. They are at all times very noisy; their cry is sharp and shrill, and they may be heard a great way off. The flesh of this bird is accounted very good.

NIGRA; Black Jacana. Hind-claws very long; legs cinereous; head, neck, tail, and body above black. It inhabits Brazil, and is about the same size as the last. The bill is of a saffron colour; the front is rufous; the breast, belly, and vent brown; quill-feathers green, tipped with brown; the wing-spurs are yellow.

BRASILIENSIS; Brazilian Jacana. The hind-claws are very long; the body of a greenish black. It inhabits Brazil and Guiana. The size and manners very much resemble those of the chestnut jacana; it is gregarious, and feeds on fish and insects; the wing-spurs are yellow.

VRIDIS; Green Jacana. Hind-claws long, yellow; legs yellowish-green; body blackish-green. It inhabits Brazil, and is of the size of a pigeon. The bill is partly red, and partly yellow; the front is red; the head, neck, and breast are of a glossy-violet; the toes are very long.

VARIABILIS; Variable Jacana. Hind-claws long; legs blueish. This is also denominated the spur-winged water-hen, and is about nine inches long. The colour of the bill is of an orange-yellow. On the forehead is a flap of red skin; the crown of the head is brown, marked with spots of a darker colour; the hind part of the neck is much the same, but of a deeper dye. On the fore part of the wing is a yellow spur. The legs are furnished with long toes, as in all the others; the colour of which is of a blueish-ash. This species inhabits Brazil, and is said to be pretty common about Carthagena, and in other parts of South America.

LUZONIENSIS; Luzonian Jacana. Beneath white; toes long; legs black. This species is found in the marshy and maritime parts of the Manilla islands.

AFRICANA; African Jacana. This species is of a pale cinnamon; the toes are long; the legs greenish-black. It inhabits Africa, and is about nine inches and a half long.

SINENSIS; China Jacana. The toes of this are long; legs greenish; body of a claret colour. It is found in China, and is about twenty-one inches long.

CHAVARIA; Faithful Jacana. Toes long; legs tawny; hind-head crested. This is the most remarkable of all the species. The bill is of a dirty-white; upper mandible like that of the dung-hill cock; on both sides, at the base of the bill, is a red membrane extending to the temples, in the middle of which are the eyes; irides brown; hind-head with about twelve blackish feathers, three inches long, forming a pendent crest; the rest of the neck is covered with thick black down; the body is brown; the wings and tail blackish; it has two, and sometimes three wing-spurs, half an inch long; the belly is of a light black; the thighs are half bare; the toes so long as to entangle each other in walking. This species inhabits the rivers and inundated places near Carthagena in America; it feeds on herbs; its gait is slow; and it cannot run unless assisted by the wings, but flies easily and swiftly. When the skin is touched, a crackling is felt; the voice is clear and loud. The natives keep one of these tame to wander with the poultry, and defend them against birds of prey, which it does by means of the spurs on its wings. It never deserts the charge committed to its care, but brings them home at night. It will readily

readily suffer itself to be handled by grown persons; but not by children; it is about the size of a cock, and stands a foot and a half from the ground.

INDICA; Indian Jacana. Blackish-blue; back and wings brown; eye-brows white; a red spot at the gape of the mouth. It is found in many parts of India, among the marshes, and builds a floating nest. The bill is yellow, the base above is blueish; the legs are of a yellowish-brown.

PARRAL, in *Geography*, a town of Mexico, in the province of New Biscay, on a river which runs into the Conchos; 230 miles N. of Durango. N. lat. $28^{\circ} 10'$. W. long. $105^{\circ} 12'$.

PARRAMATTA, a settlement founded in New South Wales, near Port Jackson; 10 miles W. of Sydney Cove.

PARRAMPORE, one of the small islands in the Atlantic ocean, which line the E. coast of Northampton county, Virginia.

PARRAN, PERE, in *Biography*, published, in 1646, a treatise on theoretical and practical music, containing the rules and precepts of composition.

PARRAS, in *Geography*, a town of Mexico, in the province of Zacatecas; 90 miles N. of Zacatecas.

PARREL, (*Rigging*.) in a *Ship*, a sort of collar, by which the yards are fastened, at the slings or middle, to the masts, so that they may be hoisted or lowered with facility. There are four different sorts of parrels, one of which is formed of a single rope, having an eye spliced in each end; and the surface of the rope, between the eyes, is *seamed* with spynarn, or covered with leather. Its middle is passed round the slings of the yard, and fastened together on the aftside of the yards; and the two ends, which are equally long, are passed round the aftside of the mast; and one of them being brought under, and the other over the yard, the two eyes are lashed together on the forefide of the yard, whilst another lashing binds them together abast the mast, having every turn secured with a knot. Another sort is formed of two ropes which have an eye at one end; the other end, as a laniard, reeves through the upper hole of the rib, and through a truck alternately, sufficient to embrace the mast; the other hole likewise reeves through the lower hole in the rib, and so on. The eye in the lower rope of the parrel passes under the yard, and the upper rope over the yard, till both eyes meet on the forefide of the yard, and there *seized* together with spynarn. The other ends of the parrel-rope are passed round the yard, and the after part of the parrel alternately, till the latter is sufficiently secured to the former; and the whole of the turns are *marked* together with quarter-leizings, to confine them close in the cavity formed on the back of the ribs. The third sort, calculated to confine the jaws of a boom to the mast, is formed of a rope which reeves through several trucks without ribs. The fourth sort, called truss-parrels, are similar to the first, having tackles hooked to their lower ends, which lead upon deck; by which the yard may, as occasion requires, be slackened from the mast, or confined more closely thereto. The latter are peculiar to the lower yards, whereon they are very convenient. The second are used for topfial yards, and the first for top-gallant yards only.

PARRENNIN, DOMENIC, in *Biography*, a distinguished Jesuit missionary, was born in 1665, and in 1682 we find him entered among the Jesuits at Avignon, with the view of engaging in their missions. In 1698 he was sent to China. The reigning emperor was at that time favourable to the Christian missionaries, on account of the scientific improvements which they introduced into his dominions, and Parrennin had masters assigned to him for instructing him in the languages of the country, in which he acquired a proficiency

beyond that of any preceding European. The emperor, who was a thoughtful and learned man, frequently conversed with him on the history, manners, and politics of Europe, and on different sciences, with which he was desirous of becoming acquainted. The missionary was obliged to study hard, to satisfy the curiosity of the Chinese monarch, and he translated into the Tartarian language every thing which he found new and curious in geometry, astronomy, and anatomy, in the memoirs of the French Academy of Sciences, and in other works. During the space of twenty years he followed this emperor in his progresses through the different provinces of the empire, and for a still longer time he acted as interpreter for all European missionaries and ambassadors, who came into China, and as mediator in the disputes between the courts of Moscow and Pekin. He drew up many books in the Chinese and Tartarian languages, as well for the information of the emperor, as the instruction of the profelytes. He wrote a vast number of letters to correspondents in Europe, relative to the business of his mission, and to the manners, customs, sciences, and occurrences of China, which were printed in Du Halde's collection. Of these the most valuable are his letters to De Mairan. From the labours of this zealous missionary proceeded the maps of all the provinces of China, and of the Chinese Tartary, with which Du Halde's description of that empire is illustrated. Parrennin died at Pekin in 1741, and was honoured by the emperor Kien-Long with a public funeral. Moren.

PARREO, in *Geography*, a town of Hindoostan, in Bahar; 23 miles W.S.W. of Patna.

PARRET, a river of England, which rises on the borders of Dorsetshire, passes by Langport, Bridgewater, &c., and runs into the Bristol channel, about ten miles below the last town.

PARRHASIA, in *Ancient Geography*, a town of the Peloponnesus, in Arcadia: it is mentioned by Homer and Pliny; but not noticed by Pausanias nor Strabo, though they speak of a mountain and people under this appellation.

PARRHASII, a people of India, beyond the Ganges, mentioned by Quintus Curtius.—Also, a people who inhabited the S.W. part of Arcadia.

PARRHASIUS, AULUS JANUS, in *Biography*, the assumed name of Gianpaolo Parisio, was born in 1470. His father, Tommaso Parisio, a counsellor in the Neapolitan senate, would gladly have brought up the son to the same profession, but the young man had imbibed so decided a taste for literature, as to refuse to settle to business. The wars in the kingdom of Naples occasioned his removal to Rome, where his life was brought into danger by his attachment to two cardinals, who had incurred the displeasure of pope Alexander VI. He escaped to Milan, where he married a daughter of Demetrius Chalcondylas, and was appointed professor of eloquence in the university. This was about the year 1500, when he first appeared as an author, by publishing his commentaries upon Claudian's Rape of Proserpine. He soon obtained a very high reputation as a lecturer, and had the most distinguished people in the country as his auditors. His fame excited against him many enemies; he was charged with citing books that never had any existence, and he was accused of crimes of an infamous nature, which have been thought to have had no other foundation than the envy of his rivals. He retired to Vicenza, where he was elected to the chair of eloquence with a liberal salary. The wars excited by the league of Cambray obliged him to quit that country, and he returned to his native place, where

he laid the foundation of the Cofentine academy, which afterwards became very famous. He after this accepted of an invitation from Leo X. to occupy the chair of eloquence at Rome; scarcely, however, had he entered upon the duties of this office, when ill health obliged him to resign: he returned to Cofenza, where after passing many years in continual sufferings, he died in the year 1534. His works were published, collectively, by Henry Stephens in 1567, of which the principal is entitled "Liber de Rebus per Epistolam Quæsitis." This consists of a number of letters written to different learned men, containing explanations of passages in the ancient writers, and elucidations of points of antiquity, which display much erudition. There are also illustrations of Ovid's Heroical Epistles; of Horace's Art of Poetry; of Cicero's Oration for Milo, and various other tracts on classical subjects. The whole collection was reprinted in the first volume of Gruter's "Thesaurus Criticus." A new edition of the book "De Quæsitis," with additions from the author's manuscript, was given at Naples in 1771. Moreri.

PARRHESIA, in *Rhetoric*, a figure in which a person admonishes or reproves another with art and address, and in such circumstances as render it difficult to displease. See Revelation, chap. ii. 2—5.

PARRIAH, in *Geography*, a town of Hindoostan, in Bahar; 35 miles N. of Durbungah. N. lat. 26° 40'. E. long. 85° 52'.

PARRICIDE, PARRICIDA, or *Patricida*, in strictness, denotes the murder or murderer of a father: as matricide does of a mother. Though the word parricide is also ordinarily extended to both.

The Romans, for a long time, had no law against parricides; which was also the case at Athens; from an opinion, that nobody could be so wicked as to kill his parents. The Persians, according to Herodotus, entertained the same notion, when they adjudged all persons who had killed their reputed parents to be bastards. L. Otilius was the first who killed his father, five hundred years after Numa's death; and then the Pompeian law was made, which ordained, that the person convicted of this crime, after he had been first scourged till the blood came, should be tied up in a leathern sack, together with a dog, an ape, a cock, and a viper, and so thrown into the sea, or the next river. By the English laws, this crime is treated no otherwise than as simple murder, unless the child was also the servant of his parent. 1 Hal. P. C. 380.

PARRICIDE is also extended to the murder of any near relation, as a husband, wife, brother, sister, child, grandchild, uncle, &c. and even to that of great or sacred persons, though no way allied in blood, as a king, &c.

PARRIER, in *Geography*, a town of Hindoostan, in Oude; 35 miles S.W. of Lucknow.

PARRIDA, a small island in the Pacific ocean, near the coast of Veragua. N. lat. 7° 16'.

PARROAH, a town of the island of Ceylon; 50 miles W.S.W. of Trincomaly. N. lat. 8° 17'. E. long. 80° 34'.

PARROCEL, JOSEPH, in *Biography*, was born in Provence in 1648, and was the pupil of Bourgoigne, whose subjects and whose style he imitated, though not with so much fire and freedom of touch. He endeavoured to improve himself by a residence at Venice for some time, and did acquire somewhat of the tones of that school. His colouring is rich, deep, and fresh; and there is great bustle and animation in his designs; which were not always warlike, but sometimes of fancy, of history, and of portrait. He died

in 1704, leaving a son, Charles Parrocel, who successfully imitated the compositions and manner of his father, and who died in 1729, at the age of 52.

There was also a nephew of the name of Ignatius, who also painted battle-pieces in the same style, and who died in 1722.

PARROQUET, or PARRAKEET, in *Ornithology*. See PSITTACUS.

PARROT. See PSITTACUS.

PARROT Islands, in *Geography*, a cluster of islands in Dusky bay, New Zealand; 3 miles S.W. of Facile harbour.

PARROT'S Key, a small island in the Spanish main, near the Mosquito shore. N. lat. 12° 7'. W. long. 82° 56'.

PARR'S POINT, a cape on the N.E. coast of the island of St. Christopher.

PARRY, RICHARD, in *Biography*, a learned divine, was educated at Oxford, and in 1604 was made bishop of St. Asaph. He revised the first edition of the Welsh bible, which was published in 1620. Before his elevation to the episcopal dignity, he was master of Ruthin school, Denbighshire.

PARRY, JOHN, generally known by the appellation of the celebrated *blind harper*. He was the first among his contemporaries, who played either a lesson or a concerto on the treble Welsh harp, an instrument which had been long lost to the world, and owed its revival to the genius and diligence of this great performer. He died at Rhuabon, in Denbighshire, in 1782, about which time the pedal harp seems to have superseded all other harps on the continent, as well as in our island, so that it appears as if its resuscitation was for a very short period. Evans played on that truly British instrument at the oratorio in 1772, on which he accompanied "O had I Jubal's lyre."

PARRYING, in *Fencing*, the action of defending a man's self, or of staying off the thrusts, strokes, &c. offered him by another. See FENCING.

Good fencers push and parry at the same time.

The Spaniards parry with the poniard. The ancients parried with their bucklers.

PARSBERG, in *Geography*, a town of Bavaria, in the principality of Neuburg; 18 miles N.W. of Ratibon.

PARSCHINA, a town of Russia, in the government of Tobolsk, on the Niznei Tunguska. N. lat. 60° 40'. E. long. 106° 54'.

PARSHEPATNAM, a town of Hindoostan, in Marawar, on the coast; 6 miles N. of Tondy.

PARSLEY, in *Botany, Gardening*, and the *Materia Medica*. See APIUM.

PARSLEY, in *Agriculture*, a well known tap-rooted biennial plant. It is observed, in the twenty-second volume of the Annals of Agriculture, that Mr. Fleet of Hampshire, famous for curing the rot of sheep, cultivates it largely with success; he sows half a bushel to the acre, with a bushel of rye-grass, with spring corn; and he finds that it lasts in the ground till it is permitted to feed. He feeds it constantly, it being excellent for sheep, and when suffered to get a-head, pigs feed wonderfully upon it in the autumn. After September, it will not run to seed. When it was ploughed up, he obtained good oats. The land was poor, and the next round of the course, the clover was much the better for the parsley having been sown, or the clover omitted; for in a field half parsley, half clover, when the clover came again to be sown, it was excellent on the parsley half, but bad on the clover part. In laying down land to grass, Mr. Hoyte, in the fourth volume of Communications to the Board, advises the sowing with twelve pounds of white clover, two pounds

of red clover, two pecks of rye-grass, and two pounds of parsley to the acre, as the parsley stands two years, and by its diuretic qualities, prevents the sheep from dying of the red-water, which too luxuriant feeds are apt to produce.

And the following trial with this vegetable, is stated in the fifth volume of the Farmer's Magazine, printed at Edinburgh. A friend of mine, says the writer, having occasion to observe the partiality of black cattle for the garden parsley, and their preference of it, when growing, to almost any other green food, took it in his head to try how it would succeed in a field that he was going to sow down for pasture. He accordingly sowed two or three ridges with parsley-feed, and the rest of the field with clover and rye-grass. As soon as the field was ready for pasture, he led his cattle into it, and it was perfectly evident that they preferred that part which was sown with the parsley to any other part of the field, inasmuch that they never touched the rest while there was a single blade of parsley to be had. Horses were equally fond of it. He had not an opportunity to try sheep upon it; but the probability is, that they would, if possible, have been fonder of it, and thriven better, than any of the other two. This, therefore, seems worthy of a farther trial. We know that black cattle, sheep, horses, and indeed every other animal, always prefer that food (when they have it in their power to make a choice) that is most agreeable to them, and most conducive to their health. We know also that parsley is a most wholesome vegetable for the human species. It is a powerful antiseptic. If we were to reason from analogy, we should suppose that its beneficial properties should extend to the animal creation in general. As it is a biennial plant, it will answer well for fields that are to be laid down for pasture for a considerable while. Sheep in particular, being of a tender and delicate constitution, and especially subject to bowel complaints, its antiseptic quality may be of great use to correct these. The difficulty may be at first to get the seed in any considerable quantity: but that may soon be remedied, if the experiment be thought worth while. He would suppose that the ground upon which it is sown must be good, in good condition and clean, otherwise it will not have a fair trial.

It should probably be sown early in the spring, and be kept constantly close fed down with stock, where it is intended to be preserved in the ground any great length of time, as probably, by preventing its sending up seed-stems, this may be effected.

More experiments are wanting to fully ascertain the value of this vegetable in field culture; but it has been found very beneficial as a rabbit-food, and would constantly be raised as one of the most proper crops where these kinds of animals are kept. See RABBIT.

PARSLEY, *Bastard*. See CAUCALIS.

PARSLEY, *Corn, field, or bastard stone*. See SISON.

PARSLEY, *Fool's*. See ÆTHUSA and CICUTA.

PARSLEY, *Macedonian*. See BUBON and PETHOSELINUM *Macedonicum*.

PARSLEY, *Milky*. See SELINUM.

PARSLEY, *Mountain*. See SPIGNEL.

PARSLEY, *Piert*. See APHANES.

PARSLING, in *Ship-Building*. See PARCELLING.

PARSNEP, in *Botany, &c.* See PASTINACA.

PARSNEP, in *Agriculture*, the name of a tap-rooted plant, cultivated for the sake of the root. This sort of crop requires a rich, mellow, and deep soil, in order that the roots may have full room to thicken and run downwards. It is the garden parsnep that is made use of in the field culture, which has a long fleshy root much larger than the carrot, and equally sweet, nutritious, and juicy. And it has been

suggested, that from its being more hardy, it is probably better suited to the northern parts of the island than the carrot. Its easy culture, and the large produce which it is capable of affording, should render it more an object of the farmer.

Soil.—The soils most adapted to this sort of crop, are those of the rich, deep, friable, loamy or sandy kinds, in which the roots can get down to a great depth, and become large. It is observed by Mr. Young, that of all the roots which a farmer can cultivate, this is the most valuable; but it demands a better soil than any other crop he can put into the ground. If he has not land of an extraordinary quality, he had better not venture on the attempt. It loves a very rich, dry, putrid, sandy loam, worth 40s. or 50s. an acre, which should be ploughed as deep as possible about the end of the autumn, and left for the frosts to exert their influence upon. This fine deep pulverization of the land is effected in different ways in different districts. In some it is given by ploughing the ground with a light plough, which is regulated in the fore part by two wheels being fixed to it, one of which runs in the furrow, and the other on the unploughed land, the former being fourteen or fifteen inches higher than the latter, and which opens down and turns the mould to the depth of about five inches; after which, the furrow is dug down with a spade, so as to form a trench of about sixteen inches in depth, proceeding in the same way till the whole of the field is prepared; but the latter, which is by means of two ploughs of different kinds, one following in the same track after the other, is by much the most expeditious and economical.

But the light plough just described, answers very well in performing the first part of the operation; and in the second, one of the trench kind must be made use of, by which the mould is raised from the bottom of the furrow made by the first, and applied over the slice it had turned up. In this way the soil is not only broken up to a great depth, but the surface left in a fine state of mould. Where this sort of tillage is practised, the work is generally performed in the more dry sorts of land about the middle of February; and in those that are retentive of moisture, towards the latter end of March. The ground, after being thus exposed to the influence of the atmosphere for a week or a fortnight, is harrowed lightly over in order to render it fit for the seed. In some cases, however, a slight ploughing is given to the lands intended for this crop in September, the use of the other ploughs being had recourse to in January in the succeeding year. The principal object in this business is, that of loosening and rendering the soil mellow to as great a depth as can possibly be done.

But though the use of manure is not in general so necessary for this crop as some others, where the land is not in tolerably good heart, it should constantly be employed in such proportions as may be sufficient to render it rich. Well-rotted farm-yard dung is the best adapted to this crop, being turned into the soil by a light plough immediately before the time of putting the seed into the ground.

Seed.—In the cultivating of this sort of crop, great care should be taken to have good perfectly ripened seed, and which should always be made use of while perfectly fresh, old seed frequently either wholly failing, or coming up with great irregularity, or in a straggling manner.

In respect to the proportion of seed that may be employed, it must be different according to the nature of the soil and other circumstances; but in general about five pounds to the acre may be sufficient for the purpose.

As to the time of sowing, the most usual period is the early part of the spring, as soon as the frosts will admit of it; as

PARSNEP.

about the beginning or middle of February, or in the following month. It is, however, sometimes sown in the autumn of the preceding year, immediately after it has been ripened and collected from the plants, as about the beginning of September. And it is contended by some, that in this way the plants will appear more early in the following spring, and of course become large and strong before any weeds rise to injure them; and that as the plants are in little or no danger from the severity of the winter season, this is, on the whole, the most eligible period. Where the soil is, however, in a proper state of preparation, as there can be no apprehensions of their being inconvenienced by the growth of weeds, the former must be the most safe and convenient season for the purpose.

The most usual method of sowing the parsnep seed is in broadcast over the land, being afterwards covered in by means of a light harrow. It is probable that this sort of crop might be sown in rows, either by means of the drill machine, or by having small furrows made in the land, and sowing the seed over it in the broadcast method, afterwards lightly harrowing it into them. In this mode, by having the rows at sufficient distances, the crops might be kept more clean and at less expence than in the simple broadcast method. But in this way they have not been found to answer so well.

The author of Practical Agriculture states, that in districts where parsneps are much cultivated as a field crop, it is the common practice to have beans at the same time with them, either planted in single rows, at the distance of four feet and a half, and about eight or ten inches from each other, or double ones at the distance of twelve feet, and eighteen inches in the rows. In this manner two crops are obtained from the same piece of ground; but unless care be taken to remove the beans in good time, great injury may be done to the parsneps. As though there may have been much leaf and stem before the roots of these plants, begin to swell out and acquire their size towards August, the beans ought never to be suffered to remain longer than that period upon the ground.

After-culture.—The management of these crops, after they have been put into the ground, is, that they require to be kept perfectly clean and free from weeds during the early parts of their growth; frequent hoeing and weeding are, therefore, to be practised. Where cultivated in rows at sufficient distances, the intervals may be cleaned by the plough or horse-hoe. It is sometimes usual, where this sort of crop forms a part of field husbandry, to have recourse to the harrow before the process of hoeing or weeding is begun. This must be performed about the time the seeds first begins to germinate; as by harrowing too soon the weeds will not have risen, and if deferred too long, there may be danger of destroying the buds of the parsneps. This is supposed more necessary on the stiffer sorts of soil, as it renders them more easily weeded. The first weeding may be performed about the beginning or middle of May, according to the forwardness of the plants, being at this operation only partially thinned out where they appear to stand much too close together. The same operation is to be again performed about the beginning of July; when the plants must be carefully set out to the distance of six inches. This sort of work is executed either by means of a small fork with two prongs, or a kind of very small spade having a short handle; the labourer, in making use of it, kneels on one knee, and, holding it in his right hand, digs and turns the mould, while with his left he pulls up and removes the weeds. After this second weeding, nothing further is found requisite in the parsnep culture.

As this sort of root strikes downwards to a great depth, and of course draws much of its nourishment from below, it may with propriety be introduced after most sorts of fibrous-rooted crops. And there is little hazard in the cultivation of parsnep crops, except from the falling of too much rain immediately after sowing, by which the seed may be in danger of being washed away; or when dry weather succeeds, from the baking of the land rendering the plants incapable of pushing their roots sufficiently down. They are seldom injured by frosts or other causes during the winter season, or liable to be destroyed by any kind of insects or other vermin.

It is stated, that the produce of this sort of crop, when cultivated on a proper soil, and in a suitable manner, will, from the great size of the roots, be equal to, if not greater than, that of the carrot kind.

Application.—With regard to the methods of application of this root, they are much the same as that of the carrot. In the fattening of cattle it is found equal if not superior, performing the business with as much expedition, and affording meat of exquisite flavour, and a highly juicy quality. The animals eat it with much greediness. It is reckoned that thirty perches, where the crop is good, will be sufficient to fatten an ox of three or four years old when perfectly lean, in the course of three months. They are given in the proportion of about thirty pounds weight, morning, noon, and night; the large ones being slit in three or four pieces, and a little hay supplied in the intervals of those periods. And when given to milch-cows with a little hay in the winter season, the butter is found to be of as fine a colour, and as excellent a flavour as when feeding in the best pastures. Indeed the result of experiments has shewn, that not only in neat cattle, but in the fattening of hogs and poultry, the animals became fat much sooner, and are more bulky, than when fed with any other root or vegetable. And that, besides, the meat is more sweet and delicate. In these applications, in the trials of an experienced farmer in Surry, the results were these: he in the first place put up sixteen hogs to fatten upon them. The method he took in giving them to the hogs, was throwing the parsneps upon the ground whole. This he continued for about a month, when finding his hogs grow heavy, he observed they did not go on so well with them as at first. Upon this he boiled the parsneps, and made wash of them; thickening the wash with half a bushel of barley-meal every day. He gave it them in a trough, and continued this for two months, when he killed them, and found them to be very good meat; weighing from 28 to 33 stone per hog. One of them, being very large, weighed 58 stone. The neat value of his hogs, when killed, amounted to 52*l.* 17*s.* 4*d.* The whole expence of his barley-meal with which he thickened the wash, amounted to 3*l.* 18*s.* 9*d.*; of the firing to boil them, at 5*d.* per day, 1*l.* 10*s.*; of a boy to look after them for three months, at 6*d.* per day, 2*l.* 5*s.*; which sums added to the expences attending the parsneps, prime cost of the hogs, &c. amount in the whole to 35*l.*; so that his profit upon this article only, is 17*l.* 16*s.* 8*d.* which remains to be carried to the account of the parsneps. After his hogs were killed, he kept four dairy cows upon the remainder of the parsneps for three months, which at 1*s.* 6*d.* per week, amounted to 3*l.* 12*s.*; and this sum added to the 17*l.* 16*s.* 8*d.* before mentioned, makes the neat profit on the one acre of parsneps to be 21*l.* 8*s.* 7*d.* But he says, he must observe, that giving his dairy cows the parsneps, answered his purpose greatly, by increasing their milk, and making the butter much richer and finer than turnips or carrots, which he had given them long before; the manner in which he gave the parsneps was,

cutting

cutting them in pieces. On finding the parsneps agree with his hogs and cows so well last year, he now determined to give them to his horses; and having five that were making up for sale, he begun with giving them a very few the first week. He observed then that they agreed with them extremely well, and he therefore gave them a larger quantity, which made them thrive very fast, and determined him to continue giving them the parsneps, which saved him a great deal of hay, as he found they had occasion for very little of it. He kept them in this manner for ten weeks, when he sent them to Mr. Bever's repository, where they were sold for forty guineas each horse. The manner in which he gave them the parsneps was, cutting them in small pieces, and throwing them into the manger. He calculates the expence half a guinea *per* week, for the parsneps for each horse, which amounts to 26*l.* 5*s.* to be carried to the account of the parsneps for this year. And he adds, that at the same time he began fattening an ox, which cost him 4*l.* 10*s.* from the plough. He was thirteen weeks in fattening, and ate nothing but parsneps the whole time. He then sold him to Job Spratley, a butcher at Guildford, for 2*s.* 8*d.* *per* stone, weighing 102 stone 6*lb.*, which amounted to 13*l.* 4*s.* 4*d.*; exclusive of the above, he had within him 22 stone 6*lb.* of loose fat, which was more than ever was known to be taken out of a bullock of that weight in the town of Guildford, and it was remarked by many, that finer beef never was eaten. He mentions these particulars, in order to shew the great use of parsneps, as he is convinced by experience, they are preferable to carrots or turnips. But to proceed on in his account; the profit upon this bullock amounted to 9*l.* 4*s.* 4*d.* which he also carries to the account of the parsneps. And, the remainder of his parsneps he gave to seven dairy cows eleven weeks, at 1*s.* 6*d.* *per* week each, which amounts to 5*l.* 15*s.* 6*d.* So that the net profit (after deducting 6*l.* 12*s.* *per* acre for the necessary expences attending the parsneps, as *per* the calculation for last year) amounts to 28*l.* 10*s.*, besides a great many of the parsneps that he gave occasionally to his store hogs and cattle, which he valued at 3*l.* 10*s.* This statement fully shews the vast advantage of cultivating this sort of crop, where the farmer has a soil proper for their being grown upon.

It has been stated, that when chopped and used with dry cut meat, horses eat them freely, and are kept in good condition with them. Parsneps are also found an excellent, wholesome, and very nourishing food for cattle in other countries.

And in France they have been used to great advantage to fatten cattle. Hogs have no other food in winter, and bullocks and oxen thrive well upon it. Cows fed with parsneps give more milk than with any other winter fodder, and it yields better butter than the milk of cows nourished with any other substance. Horses fatten with this food; though some pretend that it renders them less mettlesome, and hurts their legs and eyes.

And cattle eat these roots raw at first, sliced lengthwise; and when they begin not to relish them, they are cut in pieces, put in a large copper, pressed down there, and boiled with only so much water as fills up the chafins between them. They then eat them very greedily, and continue to like them.

And in addition to their advantages in these ways, the tops afford a large portion of green food for these sorts of live stock, either by having them cut off when taken up, or by being consumed in the field. In the last method, the most proper period of having them eaten is at the period when they begin to shrink and get dry.

In respect to their being taken up and preserved, they

may be dug up with three-pronged forks in the beginning of the autumn season, as potatoes, and be packed up in dry sheds in the same manner.

On this plant it has been remarked by Mr. Young, that when the soils are suitable, the inducement to the cultivation is very strong, as they fatten bullocks, as well as oil cake, and are of great use with hogs. They have also the valuable property of preparing the land in an excellent manner for grain crops.

To save the seeds of this plant in the most advantageous way, some of the longest, straightest, and largest roots should be singled out and planted about two feet asunder, in a place where they will be defended from the strong south and west winds; for the stems of the parsneps generally grow to a great height, and are very apt to be broken by strong gusts of wind, if they are exposed thereto. The ground should also be kept clear from weeds; and if the season should prove dry, watering the plants moderately twice a-week will increase the quantity, and improve the quality of their seeds, which will be ripe about the end of August, or the beginning of September, when the heads should be carefully cut off, and spread upon a coarse cloth for two or three days to dry. The seeds should then be beaten off, and put up for use. But neither these nor carrot-seeds should be depended on after they are above a year old, as they seldom grow well.

PARSNEP, *Cow.* See HERACLEUM.

PARSNEP, *Prickly.* See ECHINOPHORA.

PARSNEP, *Water,* the name of a species of *Sium*; which see.

PARSOI, in *Geography*, a town of Hindooستان, in Baglana; 17 miles S.W. of Naderbar.

PARSON, *Persona ecclesiæ*, the rector or incumbent of a parish-church; who has full possession of all its rights.

He is said, by some, to be thus called by way of eminence; the revenues of a church being destined to maintain *magnam personam*; or, as some will have it, because he is bound by virtue of his office, in *propria persona servire Deo*; whence *impersonare*, in old charters, is to put in possession of a parsonage, &c. Or, according to others, because the original parsons, *personæ*, were, in reality, only dignitaries, and possessed benefices, which gave them some personal pre-eminences in the church or chapter, but no power. Or, lastly, according to others, because the parson, for his time, represents his church, being in himself a body corporate, and sustaineth the person thereof, as well in suing, as being sued, in any action touching the same.

Some distinguish between a rector and parson: the rector, say they, is where the vicarage is endowed; and the parson, *persona*, where the parsonage is without a vicarage: the distinction seems new and subtle. Bracton apparently uses rector and parson as synonymous terms.

For the difference between a parson and vicar, see VICAR. The method of becoming a parson or vicar is much the same. To both the following four requisites are indispensable: *viz.* *holy orders, presentation, institution, and induction*; which see respectively. There are many ways by which a parson or vicar may cease to be so: *viz.* by death, by cession in taking another benefice, by consecration, by resignation, and by deprivation. See CESSION, CONSECRATION, RESIGNATION, and DEPRIVATION.

Formerly, he who had a church by institution and induction, only for his own life, was called *parson mortal*: but any collegiate or conventual body, to whom the church was for ever appropriated, was called *parson immortal*.

Some, again, make a distinction between *parson* simply, and *parson impersonæ*, or impersonated.

Parson *impersonce* is the rector or incumbent in possession of a parish-church, whether presentative or inappropriate, and with whom the church is full: or a parson *impersonce* is a clerk presented, instituted, and inducted into a rectory, and, therefore, in complete possession.

Parson simply, they contend, is properly the patron, or he that has the right of a presentation: called *parson*, because, before the Lateran council, he had a right to the tythes, in respect of his liberality in erecting or endowing the church, *quasi sustineret personam ecclesie*.

It is certain, in the register of writs, *persona impersonata* is used for the rector of a benefice presentative: and, in Dyer, a dean and chapter are said to be *parsons impersonce* of a benefice appropriated to them. So that *personata* seems only changed into *impersonata*, in respect of the possession of the benefice. See Coke on Litt. fol. 300.

PARSON'S *Island*, in *Geography*, a small island near the coast of Maine. N. lat. 44° 36'. W. long. 67° 25'.

PARSON'S *Town*, a town of the state of North Carolina; 60 miles W. of Salisbury.—Also, a post-town of the King's county, Ireland, formerly called *Birr*; under which name an account of it has been already given in this work.

PARSONAGE, a rectory, or parish-church, endowed ordinarily with house, glebe, and tythe, for the maintenance of a minister, with cure of souls, within such parish.

There may also be a rectory or parsonage without any glebe land, except the church and church-yard; and without any tythes, or other fixed income, except an annual payment, or pound rate.

PARSONAGE, in its original, and, at this day, in other countries, is a benefice, which gives some prerogative, or pre-eminence in a church or chapter, but without any jurisdiction.

The ancient parsonages gave a little honour and dignity as to the person, but they gave no power; whence, apparently, the name, intimating the effect of the dignity to be refrained to the person, *persona, parson*.

Such are still the chantries in several churches, and the subchantries in others.

Some, as Oldrade, &c. extend the word parsonage to dignitary, and comprehend under it the archdeacons, deans, &c. in cathedrals; but this seems to be straining the sense of the word.

In effect, the canonists use the term very differently; some applying it to all who have any prerogative in the choir or chapter, over the other canons, either in options, suffrages, elections, or barely in place and procession; thus confounding it with dignity; while others apply it to simple rectors, &c.

PARSONS, JAMES, in *Biography*, a physician, anatomist, and antiquary, was born at Barnstable in 1705. His father being appointed a barrack-master in Ireland, he was taken over to that country while an infant, and received his early education at Dublin. Choosing medicine for his profession, he went to Paris for the purpose of cultivating that science, and attended the courses of all the eminent teachers of that metropolis. He afterwards visited some other continental schools, and received the degree of doctor of physic at Rheims, in 1736. He settled in London, and was employed by Dr. James Douglas as his anatomical assistant. His practice was directed principally in the oblique line, and his residence was in Red-Lion-square. In 1740, he was elected a fellow of the Royal Society, and he maintained an intimate connection with the most distinguished of its members. He was also a fellow of the Society of Antiquaries; and he corresponded with several of the most

learned and scientific men abroad. He was every where respected for his useful and extensive acquirements, and the goodness of his heart, and died much regretted in 1770.

Dr. Parsons left the following works. 1. "A Mechanical and Critical Enquiry into the Nature of Hermaphrodites," 8vo. 1741, which was principally a compilation. 2. "A Description of the Urinary Human Bladder, and the Parts belonging to it, with Figures," 1742, which was intended to disprove the reported utility of Mrs. Stephens' medicines for the stone. 3. "Philosophical Observations, on the Analogy between the Propagation of Animals and that of Vegetables," 8vo. 1752. As an antiquary, Dr. Parsons distinguished himself by an elaborate publication, entitled "Remains of Japhet; being historical enquiries into the affinity and origin of the European languages," 4to. 1767. This is a performance of great erudition and research; but the author, like most of the speculators upon these topics, is induced, by his zeal for establishing a system, to place too much confidence in fabulous traditions and dubious remains. He finds, in the inhabitants of the British isles, the lineal descendants of Gomer and Magog, with the vestiges of their primitive language. Besides these separate publications, Dr. Parsons was the author of several papers, printed in the *Philosophical Transactions*; viz. "Croonian Lectures on Muscular Motion," 1745, in which he considers the muscular fibres as tubes; "Human Physiognomy explained," in the Appendix to the *Philos. Transf.* for 1746; and several other papers on anatomical and physiological subjects, especially an account of the dissection of a rhinoceros, which is valuable, and illustrated by good figures. Gen. Biog.

PARSONS, ROBERT, a musician of the 16th century, born at Exeter, admitted early into the chapel royal, and afterwards appointed organist at Westminster Abbey. He was extremely dexterous in writing upon a plain song, moving in slow notes of equal value; but the building harmony upon an ancient ecclesiastical chant, was no more than written discant, which is still an exercise for young contrapuntists in the conservatories of Naples, and practised in Italy by all writers for the church. During the 16th century, many of our great harmonists displayed wonderful science and abilities in these laborious undertakings, and like some of the proud sovereigns, that were led in triumph by the ancient Romans, preserved an appearance at least of dignity and independence, even in chains. There are some excellent compositions by Parsons in the MSS. of Christ-church college, Oxford, particularly an "Ave Maria," and an "In Nomine."

PARSONSFIELD, in *Geography*, a post-town of America, in York county, in the province of Maine; 36 miles N.W. of Portland; incorporated in 1785, and containing 1350 inhabitants.

PARSONSIA, in *Botany*, received that appellation from Mr. R. Brown, in memory of James Parsons M.D. F.R.S. author of "A Microscopical Theatre of Seeds," published in 1745, in quarto, as well as of an octavo volume, entitled "Philosophical Observations on the Analogy between the Propagation of Animals and that of Vegetables," printed in 1752. He wrote numerous zoological papers, in the *Philosophical Transactions*, and died in 1770. (See his article.) Dr. P. Browne, in his *History of Jamaica*, 199, had already dedicated a plant to the same purpose; but that is *Lythrum Parsonsia* of Linnæus, and really belongs to Jacquin's genus of *Cuphea*. Brown in *Tr. of the Wern. Soc.* v. 1. 64. Prodr. Nov. Holl. v. 1. 464. Class and order, *Pentandria Monogynia*. Nat. Ord. *Contorta*, Linn. *Apocinea*, Juss. Br.

Eff. Ch. Corolla funnel-shaped, naked and pervious at the mouth; limb in five deep, recurved, equilateral segments. Stamens prominent. Filaments thread-shaped, inserted into the lower part of the tube. Anthers arrow-shaped, adhering to the middle of the stigma, their hinder lobes destitute of pollen. Germens two, sometimes but one, of two cells. Style one. Stigma dilated. Scales at the base of the germen five, either separate or united.

A genus of twining shrubs, with opposite leaves. Their flowers cymose, sometimes racemose, and either situated between the footstalks, or terminal. Mr. Brown proposes to divide them thus.

SECT. 1. *American species. Germen two. Follicles distinct.*

1. *P. corymbosa*. Corymbosa Parsonfia. (Echites corymbosa; Jacq. Amer. 34. t. 30. Linn. Syst. Nat. ed. 12. v. 2. 190. Willd. Sp. Pl. v. 1. 1240. Swartz. Obf. 105.)—Clusters corymbosa, terminal. Leaves elliptic-lanceolate, acute, smooth.—Native of mountainous places in Hispaniola, flowering in November. Stem shrubby, slender, climbing to the height of 20 feet, by twining round other plants. A white milky juice is discharged from every part, when wounded. Leaves opposite, stalked, two or three inches in length, hardly an inch broad, elliptic-oblong, acute, entire, smooth; shining above; pale beneath. Flowers numerous, purple, small, in terminal, compound, corymbosa, spreading reddish clusters. Follicles very long, horizontal, reflexed, roundish, obtuse.

2. *P. floribunda*. Many-flowered Parsonfia. (Echites floribunda; Swartz. Ind. Occ. v. 1. 534. Willd. Sp. Pl. v. 1. 1239.)—Clusters corymbosa, axillary. Leaves ovate, pointed with parallel ribs. Branches straightish.—Native of bushy places on the hills of Jamaica.—The branches of this are, according to Swartz, nearly erect, flexible, tough, and somewhat climbing among the surrounding bushes, but not twining; they are smooth, furrowed in the upper part, often reddish. Leaves stalked, opposite, ovate, with a short point, entire, furnished with numerous, parallel, but not prominent, nerves, which are wanting in the foregoing species; their substance is coriaceous and laurel-like; their surface smooth and shining, paler beneath. Clusters axillary, compound, corymbosa, shorter than the leaves. Flowers small, whitish.

3. *P. spicata*. Spiked Parsonfia. (Echites spicata; Jacq. Amer. 34. t. 29. Linn. Syst. Nat. ed. 12. v. 2. 190. Willd. Sp. Pl. v. 1. 1240.)—Spikes axillary, opposite, dense, much shorter than the leaves. Leaves ovate-oblong.—Gathered by Jacquin near Carthage, in close woods, where it twines round the loftiest trees, to the height of more than sixty feet. The stems are an inch in diameter, ornamented, here and there, with alternate, leafy branches, about eighteen inches long. Leaves six inches long, veiny, nearly smooth. Spikes an inch and a half long, dense, rarely divided, composed of numerous small white flowers, with scarcely any scent. Jacquin could never meet with the fruit, the flowers being all, as far as he could discover, in the course of many months, abortive. They are chiefly produced in July and August.

SECT. 2. *Australasian species. Germen of two cells. Follicles cohering lengthwise.*

4. *P. capsularis*. New Zealand Parsonfia. (Periphoca capsularis; Forst. Prodr. 20. Willd. Sp. Pl. v. 1. 1251.)—Clusters cymose, downy, many-flowered. Leaves obovate, emarginate, smooth.—Gathered by Forster in New Zealand.—His specimen before us does not answer to his specific character, the leaves being by no means lanceolate, but obovate, emarginate, an inch or inch and half long, entire, smooth on both sides, paler beneath. The stem is twining.

Young branches downy. Flowers numerous, in repeatedly branched, downy-stalked, lax, cymose clusters, or panicles, which terminate the short lateral leafy shoots. In size and general appearance the flowers resemble those of *P. corymbosa*, but of their colour we know nothing. The calyx is downy, as well as the outside of the corolla. We know not to what the specific name alludes.

5. *P. velutina*. Velvet-leaved Parsonfia. Br. n. 1.—“Cymes stalked, opposite. Leaves heart-shaped, ovate, acute or somewhat pointed, downy.”—Gathered by Mr. Brown in the tropical part of New Holland.

6. *P. mollis*. Soft-leaved Parsonfia. Br. n. 2.—“Cymes divided. Leaves lanceolate, pointed, downy and soft.”—From the same country.

7. *P. lanceolata*. Smooth-lanceolate-leaved Parsonfia. Br. n. 3.—“Cymes divided. Leaves lanceolate, pointed, smooth.”—Gathered, like the two last, in the tropical part of New Holland, by Mr. R. Brown, whose specific characters are all we know of the history of these three species. This genus is entirely a stranger at present in the gardens of England; and is, as its author remarks, but too nearly related to *Lyonsia*, see that article, from which it differs only in having distinct follicles, or at least merely cohering in some species, whereas in *Lyonsia* they are perfectly united into a cylindrical capsule, divided into two cells by a parallel distinct partition.

PART, PARS, a portion of some whole, considered as divided, or as divisible.

Quantity is divisible into an infinite number of parts, not equal parts, but proportional ones. Philosophy is divided into four parts; viz. logics, ethics, physics, and metaphysics.

The schoolmen usually distinguish parts into logical and physical.

PART, *Logical*, is that referring to some universal as its whole; in which sense, the species are parts of a genus; and individuals, or singulars, are parts of the species.

PART, *Physical*, is that which, though it enter the composition of a whole, may yet be considered apart, and under its own distinct idea; in which sense, a continuum is said to consist of parts.

Physical parts, again, are of two kinds, homogeneous and heterogeneous; the first are those of the same denomination with some other; the second of a different one. See HOMOGENEOUS, &c.

Parts, again, are distinguished into subjective, essential, and integrant.

PART, *Subjective* or *Potential*, is the same with logical part; viz. that contained in some universal whole, not in act, but only in power. As, man and horse are in animal: Peter and Paul are in man.

PART, *Essential*, is that whereby, with the concurrence of some other, an essential whole is constituted. Thus, the body and soul are essential parts of men.

PART, *Integrant*, or *Integral*, is that which is necessary to the integrity of the whole. As, a head is of a man, &c.

Anatomists divide the parts of a human body into containing and contained; similar and dissimilar; and the similar, again, into spermatic and sanguineous, &c.

PARTS, *Noble*, or *Essential*, are those absolutely necessary to life. As the heart, lungs, liver, brain, &c.

PARTS, *Natural*, or *Genital*, popularly called *privy parts*, are those ministering to generation.

The finest writings of physicians are those which treat of the use of the parts. Galen's works, “De Usu Partium,” afford infinite arguments of the being and wisdom of God.

Nature, we say, always discharges itself on the weak part, the diseased part, the part affected, &c.

PARTS, *Consent of*. See **CONSENT**.

In chemistry, bodies are said to be resolved into their minute parts, their component parts, &c.

That art is said to separate the homogeneous parts from the heterogeneous; and the volatile, subtile, sulphureous, mercurial, &c. parts from the fixed, crass, earthy, viscid, &c. parts.

PART, in *Geometry* and *Astronomy*, is applied to the divisions of lines and circles.

The semidiameter of the circle, called also the radius, and whole sine, is divided into a hundred thousand parts; and the circumference of the circle into three hundred and sixty parts or degrees, in which two divisions all the celestial computations are made.

PARTS, *Aliquant* and *Aliquot*. See the adjectives.

PART, *Proportional*, is a part or number agreeable and analogous to some other part or number: or a medium to find some number or part unknown by proportion and equality of reason.

PARTS, *Similar*, are those which are to one another as their wholes are to one another.

PART, *Organical*. See **ORGANICAL**.

PART, in *Music*, denotes a piece of the score or partition written by itself, for the convenience of the musician; or it is one or more of the successions of sounds which make the harmony, written apart.

Or, the parts are the sounds made by several persons singing or playing in a concert.

Music in parts was unknown to the ancients; they had but one part; all their harmony consisted in the succession of notes, none in the consonance.

There are four principal parts; the treble, bass, tenor, and counter-tenor.

Some compare the four parts in music, to the four elements: the bass, they say, represents the earth; the tenor, water; counter-tenor, air; and the treble, fire.

PART, in *Trigonometry*. In a rectangular spherical triangle, *ABC*, (*Plute I. Trigonometry, fig. 3.*) that part lying between two others, considered as extremes, is called, by some authors, the middle part. Thus, if *AB* and *BC* be the extreme parts, the angle *B* will be the middle part.

If the parts, considered as extremes, be contiguous to the middle part, and one of the extremes; those are called conjunct parts. Thus, if *B* be in the middle part, *AB* and *BC* will be in the conjunct parts.

If, between the extremes and the middle part, there lie another, besides a right angle; then the parts are said to be disjunct or separate; *e. g.* if *B* be the middle term, *AC* and *C* will be disjunct parts; because, between the middle part *B*, and the extreme *C*, there lies the hypotenuse *BC*, and between the middle part *B*, and the other extreme *AC*, besides the right angle, there lies the leg *AB*.

Those parts either joined to the middle part, or separated from it, are called lateral parts. See **CIRCULAR PARTS**, **TRIANGLE**, and **TRIGONOMETRY**.

PARTS of Speech, in *Grammar*, are all the sorts of words which enter the composition of discourse.

The grammarians usually admit of eight parts of speech; *viz.* noun, pronoun, verb, participle, adverb, conjunction, preposition, and interjection. See each in its proper place, **NOUN**, **PRONOUN**, &c.

PART of Fortune, in *Judiciary Astrology*, is the lunar horoscope; or the point wherein the moon is, at the time when the sun is in the ascending point of the cast.

The sun in the ascendant is supposed, according to this

science, to give life; and the moon dispenses the radical moisture, and is one of the causes of fortune. In horoscopes the part of fortune is represented by a circle divided by a cross.

PART, in the *Manege*. in French, *partir*, is used to signify the motion and action of a horse when put on at full-speed. From the horse's parting to his stop there are commonly two hundred paces of ground. To make your horse part with a good grace, you must put your bridle three fingers lower, and press gently with your heels, or only with the calves of your legs. See **ECHAPER**.

To PART again. See **REPART**.

PART Owners, those that are concerned in ship matters, and who have joint shares therein.

PART and Art, in *Law*. See **ART**.

PARTABPOUR, in *Geography*, a town of Bengal; 25 miles E. of Midnapour. N. lat. 22 21'. E. long. 87 50'. — Also, a town of Hindoostan, in Oude; 10 miles E. of Fyzabad.

PARTAPAH, a town of Hindoostan, in Bahar; 13 miles N. of Hajypour. N. lat. 25 54'. E. long. 85 28'.

PARTE, in *Italian Music*, implies the voice part of a song, or *la parte che canta*.

PARTE, *Ex*, in *Law*. See **EX**.

PARTENI, in *Geography*, a river of Natolia, which runs into the Black sea, near Amasieh.

PARTENKERCH, a town of Bavaria, in the bishopric of Freyting; 6 miles S. of Weilkaim.

PARTERRE, in *Gardening*, a spacious level spot of ground in the pleasure garden, divided into many little partitions of different figures and dimensions; by means of edgings or lines of dwarf-box, or by verges of grass turf, with fine gravel walks between, &c. These sorts of works were formerly in great estimation, and were commonly situated directly in the front of the house, generally the whole width, and sometimes more, extending proportionably in length: and where the intermixture of the figures is artfully disposed, they strike the eye very agreeably, and afford an ornamental effect at all seasons.

For the most part, the general figure of a parterre is an oblong or long square, about as long again as broad: a level open spot in some conspicuous part, as above, is mostly chosen for the purpose: first forming a long bed, or border of earth, all round for a boundary; the internal space within this border being then traced out into various little partitions, or inclosures, artfully disposed into different figures corresponding to one another, such as long squares, triangles, circles, various scroll-works, flourishes of embroidery, and various other devices; all of which are formed either by lines of dwarf-box, with intervening alleys and tracks of turf, sand, fine gravel, small shells, &c. as above, or formed sometimes entirely of verges of fine turf, disposed into wide or narrow compartments, as the figure may require: and sometimes they consist of box-edgings, and tracks of turf, together; the partitions, or beds of earth, formed by the tracks of box and turf, &c. being planted with some choice flowers; but no large plants to hide the form, as the regularity of it, in the artful distribution of the different figures, is intended as a decoration to the whole place long after the season of the flowers is over. Some prefer parterres composed entirely of turf and beds of earth, perfectly even, without any other figure than the long square, forming a border of earth all round, within which are spots of grass, and beds or borders of earth of different sizes, and sometimes parterres, with box-edgings, are formed into labyrinths, or mazes; and some are made to represent coats of arms with the proper supporters. All crowded designs, however,

however, lose their effect. But works of this sort are now almost wholly in disuse in this country: however, for the sake of variety, they may, on some occasions, still be admitted, though not immediately in the front of the house, but in some convenient place.

Parterres, therefore, vary in their forms, extents, and kinds from those of the common flower gardens to be met with in many parts of the country, or the remains of those old French parterres, which contained the shapes of family arms, animals, &c. cut in the trees, and shell-works of different sorts. Nuneham and Beaumont-hall have gardens of the first kind; and Wentworth-castle, and Leven's-park, furnish examples of the latter description.

It is noticed by Mr. Loudon, that in *ornamental* gardens and parterres of every kind, the soil should be unmanured, and rather poor than otherwise; but the situation and exposure should be good, and the surface of the ground beautifully varied. The extent of them must be in proportion to the nature of the place to which they belong. In general they need not be large. In almost every kind, a few trees and shrubs should be introduced, to remove from the general view the appearance of insipidity, and to break it into separate scenes; one of which alone should be seen at a time, that the extent of vision being circumscribed, the spectator may thus be induced to examine or admire the minute beauties of single objects, or small compositions. And it is observed, that where parterres are intermingled with lawns, those disgusting lines of separation at the edges of walks, or round groups and dug patches of flowers or shrubs, which abound every where, should not be introduced; the gravel of the walk, and the earth at the edges of the dug patches or groups, ought to be kept nearly on a level with the grass on the lawn. Where much culture is requisite in the groups, the line of separation should be delicate and graceful; and where this is not necessary, or not much attended to, both the lines of the walk, and the lines of the dug group, or patch, should blend and harmonize, and, in a natural easy manner, glide insensibly into each other. The most remarkable varieties of parterres are these.

1st. The general flower garden parterre, that should contain such a variety of beautiful trees, shrubs, and flowers, &c. as that a number of each will be in perfection every month of the year, particularly in the summer season. They should be placed in irregular groups and thickets, of different sizes, gliding into one another on smooth lawn, beautifully varied, and broken into small confined scenes by trees and shrubs of the most elegant sorts. And throughout the whole, smooth gravel walks should wind in a graceful and easy manner. In this kind of garden parterre, a greenhouse and stoves for exotic plants and trees may be placed. In the summer season, those plants which are reared in the greenhouse may be dispersed throughout the garden; and the pots being sunk in the earth, the plants will appear as natives; or they may be arranged in a situation by themselves, and retain their own character; and, during this season, the house may be filled with balsams, coxcombs, amaranths, and other tender annuals. And few elegant seats, both covered and uncovered, may also be introduced; but no grottos, urns, busts, or temples, which have all their proper places in ornamental scenery, but which, as has been formerly remarked, are unsuitable to this kind of scene.

2dly. The winter garden parterre, which should contain principally such trees, shrubs, plants, and other kinds of growing vegetables, as are in perfection, or retain their verdure, during this severe season; as most of the evergreen tribe; and several flowering plants, as aconite, Christmas-

rose, &c. and they should be *grouped* and arranged in the *natural* manner, a dry gravel walk being carried and conducted throughout the whole. In regard to situation, this sort of parterre should constantly be placed near to the mansion or residence, in order that it may be conveniently and comfortably approached in the winter months, and the conservatory should be occasionally placed in it.

3dly. The spring garden parterre, which should comprehend all those deciduous shrubs and trees which blossom or put forth leaves the most early in the spring, such as the almond, the mezereon, the fringe tree, and several others which possess the same qualities. Also all the early-blowing flowers, as well those of the bulbous, as the fibrous-rooted kinds, as the narcissus, crocus, iris, cowslip, auricula, hepatica, and many others. Here the walks should likewise be gravelled, and but very little, or no lawn at all, appear to the eye.

And it is proper that this sort of garden parterre should contain a house or other erection for heaths, auriculas, and other early-flowering plants. It should also be placed near to the former, and be connected with it and the mansion or residence by a comfortable gravel walk, that they may be approached at any season. The soils of both should be light and dry, the situations well exposed to the sun, and sheltered from the north and easterly blasts or storms.

4thly. The autumn garden parterre, which ought to comprise such a collection of ornamental plants and trees as may be in full perfection at this season of the year, as most sorts of annual flowers when late sown; many kinds of herbaceous plants, as the aster, solidago, and several others, as well as various trees and shrubs that continue a long time in perfection, as the honey-suckle, the rose, acacia, and some others.

5thly. The bulbous root parterre, which requires to be somewhat different in form and design from any of these. The general form in this sort should be as regular as possible. It may be a square, a circle, or an oval, divided into compartments, and each of these laid out into beds of three or four feet broad. In this sort may be grown the different varieties of tulips, hyacinths, ranunculuses, anemones, and other similar root plants, each being cultivated in its proper sort of soil or earth, and such a parterre may contain a stove or hot-house for the ixia and amaryllis tribe of plants, as well as for other similar bulbous exotics, and have near it the auricula and carnation shed.

6thly. The parterre garden may also be formed solely for the purpose of cultivating any particular family, genus, or species of shrubs or plants. In this way there may be a parterre garden of roses, of annual flowers, of pinks and carnations, of double flowering plants and trees, of variegated kinds only, and several others; also parterres of ferns, of grasses, and of the vegetables, natives of any particular country, as those of the Cape, America, Siberia, the Alps, or of any other part of the world.

Parterres may likewise exist in the forms of the ancient British flower gardens, the Chinese gardens, the Grecian, Roman, Italian, French, and Dutch gardens, as well as in those of the modern British flower gardens.

And they are not only pleasing and amusing in themselves, but when introduced in a pleasure ground, by their contrast with other scenes, and with one another, may add to the variety and interest of that kind of ornamental scenery.

PARTESTI, in *Geography*, a town of Bukovina; 18 miles W. of Sueseva.

PARTHA, a river of Saxony, which runs into the Pless, near Leipzig.

PARTHA, in *Mythology*, a name of the Phallic emblem, worshipped

worshipped by certain sects of Hindoos, and called by them *Linga*; see that article. The Part'ha is, we believe, a domestic idol, made of the usual conical form, with clay, and without any thing indecent in its appearance, for females to pay their daily adoration to. It is sometimes placed under a tree, and circumambulated a certain number of times daily, especially by barren females, in the hope of offspring. This ceremony is called *pradakshna*, and is described under that word.

PARTHENAY, CATHERINE, in *Biography*, heiress to the lordship of Soubise, was married, in 1568, to the baron de Pons, and afterwards, in 1575, to Renatus, viscount Rohan. The celebrated duke de Rohan, who so courageously defended the Protestant cause in France during the civil wars of Louis XIII. was her eldest son. Catherine, one of her daughters, has rendered her name illustrious by the following answer which she made to Henry IV. who solicited her favours: "I am too poor, sire, to be your wife, and too proud to be your mistress." She afterwards married the duke de Deux-Ponts. Catherine, the subject of this article, was at Rochelle at the time of its memorable siege, and when the place surrendered, she and her daughters were sent to the castle of Niort. She died in 1631, at the age of seventy-seven. She published poems in 1572, and likewise a tragedy, entitled "Holofernes," which was performed at Rochelle. She translated the precepts of Ilocrates to Demonicus into the French language. Bayle. Moreri.

PARTHENAY, in *Geography*, a town of France, and principal place of a district, in the department of the Two Seves, near the river Thoue. The place contains 3213, and the canton 6319 inhabitants, on a territory of 262½ kilometres, in 11 communes. The trade of the town, which is considerable, consists in cattle and corn; 21 miles N.N.E. of Niort. N. lat. 46° 38'. W. long. 0° 10'.

PARTHENIA, is the title of a thin folio book of lessons for the Virginal, that was engraved on copper, and published in the reign of king James I. under the following title: "Parthenia, or the Maidenhead of the first Musicke that ever was printed for the Virginals. Composed by three famous masters: William Byrd, Dr. John Bull, and Orlando Gibbons, Gentlemen of his Majesties most illustrious Chappel." Bird being here called "Gentilman of his Majesties chappel," seems to imply, that he was still living when it was published. King James died in 1525, and Bird in 1523. The three first movements in this collection, consisting of a *Preludium*; *Pavana*; fir William Peder; and a *Galiardo*; are in G minor, and may be called a *Suite* of lessons. The fourth and fifth movements, *Preludium*; and *Galiardo*, Mrs. Marye Brownlo, in C; and the sixth, seventh, and eighth, *Pavana*, the earle of Salisbury; *Galiardo primo*; and *Galiardo secundo*, Mrs. Marye Brownlo, in A minor; constitute what may likewise be regarded as two other *Suites de Pieces*, or sets of lessons.

PARTHENIA, or *Parthenos*, in *Mythology*, an epithet given to Minerva, because she is said to have preserved her virginity. When the Rhodians neglected the worship of that goddess, and their care in improving the fine arts, the Athenians began to distinguish themselves in this respect, and took her for their patroness. Accordingly they dedicated to her a magnificent temple under the name of Parthenos, the virgin. Phidias adorned it with a statue of gold and ivory, which was a master-piece; and the Athenians also celebrated to her honour a festival, which was afterward called "Panathenaia." *Parthenos* was also a name given to Juno, from a notion that this goddess, by bathing herself every year in the fountain called Canathos, which was at Nauplia, recovered her virginity; a fable, founded, according to Pausanias, upon

the secret mysteries that were celebrated in honour of this goddess.

PARTHENIA, in *Ancient Geography*, a town of Illyria, according to Polybius; called by Julius Cæsar "Oppidum Parthinorum."

PARTHENIAS, a river of Triphylia, which ran from N. to S. and discharged itself into the river Alpharus, near Olympia.

PARTHENIASTRUM, in *Botany*. See PARTHENIUM.

PARTHENICUM, in *Ancient Geography*, a town of Sicily, upon the route from Lilybæum to Tyndaride, between Segestena and Hyccara, according to the Itin. of Antonine.

PARTHENIUM, KARANDIP, a village of the Tauric Chersonesus, in the narrowest part of the strait called Cimmerian Bosphorus, 60 stadia above Panticapæum, and over against Achillæum. Strabo.—Also, a promontory of the Tauric Chersonesus, nearly S. of Chersonesus. Near this promontory was a temple and a statue of the goddess of the country.—Also, a town of the Peloponnesus, in Arcadia. Pliny.—Also, a town of Asia, in Mysia, in the vicinity of the Troade. Pliny.—Also, a town of Greece, in the island of Eubœa.

PARTHENIUM *Mare*, the name of a part of the Mediterranean sea, which bathed Asia and Africa, in the place where these two regions of the globe joined each other. Macrobius.—Also, a promontory in the vicinity of the town of Heraclea.

PARTHENIUM, in *Botany*, a name adopted from Dioscorides, whose *παρθενιον* however is sufficiently well described, particularly in the comparison of its leaves to those of Coriander, for us to perceive that his plant is the Feverfew, *Matricaria Parthenium* of Linnæus, *Pyrethrum Parthenium*, Sm. Fl. Brit. 900, as all commentators have been agreed. The name, from *παρθενος*, a virgin, alludes to its reputed efficacy in some female complaints; see MATRICARIA and PYRETHRUM. The above name being therefore unemployed as a generic one, Linnæus applied it to a new genus, much resembling the ancient herb in aspect, and perhaps in sensible qualities, which Nissol and Dillenius, on account of such resemblance, had called *Partheniastrum*. Linn. Gen. 489. Schreb. 636. Willd. Sp. Pl. v. 3. 2385. Mart. Mill. Dict. v. 3. Juss. 191. Lamarek Illustr. t. 766. Gærtn. t. 168. (Argyrochæta; Cav. Ic. v. 4. 54)—Class and order, *Monoecia Pentandria*, Linn. rather *Syngenesia Polygamia-necessaria*, as Willdenow, and even Linnæus in his earlier publications, have it. Nat. Ord. *Compositæ nucamentacea*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Cal.* Common Perianth perfectly simple, of five spreading, roundish, flat, equal leaves. *Cor.* compound, convex: perfect florets several, in the disk, each of one petal, tubular, erect, as long as the calyx, with a five-cleft regular border; female florets five, in the radius, scarcely taller than the others, each of one petal, tubular, ligulate, oblique, obtuse, roundish, the length of the former. *Stam.* in the perfect florets, filaments five, capillary, the length of their corolla; anthers as many, thickish, scarcely cohering. *Pist.* in the perfect florets, germen inferior with respect to the proper receptacle of the floret, but scarcely discernible; style capillary, rather shorter than the stamens; stigma none: in the female florets, germen inferior, heart-shaped, rather turbinate, compressed, large; style thread-shaped, the length of the petal; stigmas two, thread-shaped, as long as the style, rather spreading. *Peric.* none, except the calyx, which remains unchanged. *Seeds* of the florets of the disk abortive; those of the female flowers of the radius turbinate-

hear.-

heart-shaped, compressed, naked. *Recept.* very small, convex. There are scales separating the florets, in such a manner that each female has two perfect ones at its back.

Ess. Ch. Receptacle chaffy, small. Seeds obovate. Down none. Calyx of five leaves. Florets of the radius five; of the disk numerous.

1. *P. Hysserophorus*. Cut-leaved Bastard Feverfew. Linn. Sp. Pl. 1402. Ait. Hort. Kew. ed. 1. v. 3. 345. (*Argyrochæta bipinnatifida*; Cavan. Ic. v. 4. 54. t. 378. *Matricariæ Achaovan distæ similis*, &c.; Pluk. Phyt. t. 45. f. 3.)—Leaves pinnatifid, many-cleft.—Native of Jamaica, and other parts of the West Indies, as well as of Mexico. The root is annual. Stem much branched, two feet high. Leaves alternate, doubly pinnatifid, with rounded sinuses, nearly smooth. Panicles terminal, compound, spreading, of numerous small white flowers, which have little beauty to recommend them, so that although the plant is raised every now and then in gardens, from foreign seed, it is seldom preserved. Cavanilles was not aware of its being already described, when he saw it flowering at Madrid in July 1797, and therefore considered it as a new genus. He describes the *stamens* as four only, the *anthers* forming a tube. The Linnæan specific name alludes to the generic appellation given by Vaillant, founded on an obscure anatomical comparison.

2. *P. integrifolium*. Entire-leaved Bastard Feverfew. Linn. Sp. Pl. 1402. Mill. Illustr. t. 80. Willd. Hort. Berol. 4. t. 4. (*Parthenium helenii folio*; Dill. Elth. 302. t. 225.)—Leaves undivided, oblong, toothed.—Native of North America; Michaux says Virginia and the hilly parts of Carolina. It has been 150 years, or more, in our gardens, flowering from June to the end of autumn. Root perennial. Herb much stouter and taller than the former, rough and harsh. Leaves ovate-oblong, acute, rigid, rough, coarsely crenate or toothed, with one rib and many transverse veins; the upper ones clasping the stem; the lower larger, and somewhat stalked. Flowers in dense, terminal, corymbose panicles, white, said to droop on the approach of night, which we have had no opportunity of observing.

PARTHENIUM, in *Gardening*, contains plants of the annual and perennial kinds, of which the species are the cut-leaved parthenium, or bastard feverfew (*P. hysserophorus*); and the entire-leaved parthenium (*P. integrifolium*).

Method of Culture.—The first sort may be increased by sowing the seeds on a hot-bed early in the spring; and when the plants come up, transplanting them upon another hot-bed, about five or six inches distant, giving them water and shade until they have taken new root; after which, they must have a pretty large share of fresh air in warm weather, by raising the glasses of the hot-bed every day, and be duly watered every other day at least. When the plants have grown so as to meet each other, they should be carefully taken up, preserving a ball of earth to their roots, and each planted into a separate pot filled with light rich earth; and be plunged into a moderate hot-bed till fresh-rooted; after which they may be exposed, with other hardy annual plants, in a warm situation, where they will flower in July; but if the season should prove cold and wet, it will be proper to have a plant or two in shelter, either in the stove, or under tall frames, in order to have good seeds, if those plants which are exposed should fail.

The second sort may be increased by parting the roots in autumn, and be planted in the full ground, where it will abide the cold of our ordinary winters.

They afford ornament in the borders, and among potted plants.

PARTHENIUS, in *Ancient Geography*, a river of the isle of Samos.—Also, a river of Asia Minor, which ran into the

Euxine sea, and separated the territories belonging to the towns of Amathris and Teium. Strabo. This geographer represents it as a beautiful river which pursued its course among meadows, and it had the name of the "Virgin," on account of the worship paid to Diana on its banks.—Also, a river of Asia, in Cilicia, near the town of Anchiala. Suidas.—Also, a mountain of the Argolide, which extended from W. to E., from the Argolic gulf to the frontiers of Arcadia. The poet Callimachus describes this mountain by the expression, "The sacred mountain of Augé:" denoting, as it is supposed, that on this mountain passed the amours of Hercules and Augæa, of which Telephus was the fruit.

PARTHENOPE, an island of the Tyrrhenian sea. Ptolemy.

PARTHENOPOLIS, a town of Macedonia. Steph. Byz.—Also, a town of Asia, in Bithynia, which did not subsist in the time of Pliny.—Also, a town of Upper Mæsia, subjugated by Lucullus.

PARTHIA, called by the Greeks *Parthya* and *Parthyene*, a province of the Persian empire, bounded on the W. by Media, on the N. by Hyrcania, on the E. by Asia, on the S. by Carmania the Desert; surrounded with mountains, which served for boundaries on all sides. In this restricted sense, Parthia must not be confounded with what the ancients called the Parthian empire, which was of vast extent; being bounded on the E. by the Indus, on the W. by the Tigris, on the S. by the Red sea, and on the N. by mount Caucasus, so that it comprehended Arachosia, Parthia Proper, Assyria, Persis, and Media. The ancient geographers enumerate a great many cities in Parthia; the most noted of which were Calliope, Ispatis, Europum or Arface, Apamea, Heraclea, Crenonia, Charax, Artacana, Aspa, Marriche, Rhagæa, and Hecatompylos. The latter was the metropolis of Parthia, or the place where the first kings of that country resided; for after they had made themselves masters of Assyria, they abandoned Hecatompylos, passing the winter at Ctesiphon, and the summer at Ecbatan, or in Hyrcania. (See CTESIPHON.) Hecatompylos was only the metropolis of Parthia properly so called; nevertheless, it was a place of great note, and about nine miles in compass. It had a hundred gates, whence it borrowed its name. Most modern travellers are of opinion, that it stood on the spot where the present city of Ispahan stands. Parthia is at present known by the name of Erach or Irac, and may be called the royal province of Persia, since the king always resides in it; and, by way of distinction from Chaldæa, which is likewise called Erach or Irac, this is denominated *Irac-Agemi*, which see. The chief cities it contains at present, are, Casbin or Caswin, built on the ruins of the ancient Arface, Sawa or Sava, Kom, Hamadan, Kashan, and Ispahan. Ptolemy reckons twenty-five large cities within the province of Parthia; and it must certainly have been very populous, since many cities and about 2000 villages are reckoned to have been destroyed by earthquakes.

The air of Parthia was anciently, and is still, very clear and healthy; but the soil barren, and not affording provisions sufficient to maintain the inhabitants, who were once very numerous, and therefore obliged to transplant themselves into other countries. Upon the death of Alexander the Great, it was almost entirely neglected, and left as an appendage to Media, that prince's commanders declining the government of so poor and barren a province. In fabulous history the Parthians, who have been reckoned so famous, have been traced to Pathrusim, the son of Mizraim. However this be, they were, without doubt, originally Scythians, driven out of their own country, and obliged

PARTHIA.

to settle in this barren and inhospitable region. They called themselves, on their first settling here, Parthians; that is, in the old Scythian language, *exiles*; and hence, it is said, originated the name of Parthia.

The Parthians were a courageous and warlike people, not undeservedly esteemed the best horsemen and archers in the world. They were accustomed, from their infancy, says Dionysius (in Poem de situ Orb.), to the warlike and manly exercises of managing a horse and handling a bow; and in both excelled all other nations. They had the art, peculiar to themselves, of discharging their arrows with incredible dexterity, whilst they were retiring at full speed, so that their retreat was more formidable than their attack. To these exercises of horsemanship and archery, the air and country very much contributed; for the dry air, as Dio observes, seasoned their bows, and their extensive plains afforded them room for training their horses. From the age of 20 to 50, they were all, without exception, obliged to serve in war, to attend the musters, learn the military exercises, and be ready, at a very short warning, to take the field. Persons of any rank or distinction among them never appeared in public on foot, but always on horseback, armed with scimitars. In war they did not use trumpets like other nations, but large hollow vessels of brass, covered with skins, such as our kettie-drums, which, being beat with hammers, yielded a very warlike sound. The Roman poets often refer to the military character and evolutions of the Parthians. Thus Virgil says in his "Georgics," l. iii.

" Fidentemque fuga Parthum versifque Sagittis."

Horace, "lib. i. Carm. Od. 19." says:

" Et versis animosum equis
Parthum dicere."

And Ovid, "lib. iii. de Art. Am." observes,

" Ut celer aversis utere Parthus equis."

In his "Fasti, lib. v." we have the following couplet:

" Quid tibi nunc mitti solitæ post terga sagittæ?
Quid loca, quid rapidi præfugit usus equi."

Seneca, the tragedian, in his "Thyeste," says,

" Nil opus est equis
Nil armis et inertibus
Telis, quæ procul ingerit
Parthus, cum simulat fugas."

Some have said that they had recourse to the aid of lions in their combats, and that at the commencement of a battle, they let them loose against the enemy: to this purpose Lucretius (l. v.) says

" Et validos Parthi præ se misere leones
Cum ductoribus armatis, sævisque magistris."

Their religion was much the same with that of the Persians, and they worshipped the sun under the name of "Mithras." They believed that those who fell in battle enjoyed perpetual happiness; a doctrine suited to the genius of a warlike nation. They were religious observers of their promises, thinking it highly dishonourable not to perform their engagements, or to deceive those who reposed their confidence in them.

As to their government, it was monarchical, and in the highest degree absolute. The kings treated their subjects as the meanest of slaves, and scarcely as men, whilst they put themselves on a level with the immortal gods. Their usual titles were "the king of kings, the great monarch,

the brother of the sun and moon." These haughty titles they not only assumed in all the laws and edicts they enacted, but in their letters to other princes. Their conduct corresponded to the lofty titles which they assumed; for they obliged all whom they vouchsafed to see, to kiss the threshold on their first entrance into the royal palace; to prostrate themselves before them on the ground, and to acknowledge their majesty with some offering.

The history of the Parthians is involved in great obscurity before the time of Arsaces I. They were first subject to the Medes, afterwards to the Persians, and lastly to Alexander the Great, upon whose death Parthia fell to the share of Seleucus Nicator, whose successor held it till the reign of Antiochus Theus, when Arsaces, shaking off the Macedonian yoke, founded a new kingdom, which became much the most powerful in the East. Arsaces I. was properly the founder of the Parthian monarchy. Having induced the Parthians to revolt from Antiochus Theus, and having defeated and taken prisoner his son and successor, Seleucus Callinicus, he assumed the title of king, and established an empire in the East, which counterbalanced the overgrown power of the Romans in the west. He reduced Hyrcania, and some other neighbouring provinces; and was at last killed in a battle against Ariathes IV. king of Cappadocia. From him all his successors of the same race took the name of Arsaces; so that the empire of the Parthians was sometimes denominated the empire of the Arsacides. Arsaces II. succeeded his father, and made himself master of Media, whence he was driven by Antiochus the Great. Retiring into Hyrcania, he assembled a formidable army, and compelled the king of Syria to make a disadvantageous peace; for he abandoned Parthia and Hyrcania to Arsaces. After two reigns, the Parthians became very powerful under Mithridates I. The reign of this prince is regarded by authors as the epoch of the Parthian grandeur; for, under him, that empire was by far the most extensive, as well as powerful, in the East: all the countries that lie between the Euphrates and mount Caucasus receiving law from him, and most of the princes of Asia being either subdued, or obliged to enter into an alliance with him, upon his own terms. Phraates II, who succeeded him, was overcome in three successive battles by Antiochus Sidetes, king of Syria; and having been deprived of Mesopotamia, Babylonia, and the other countries which his father had reduced, was confined within the narrow limits of the first Parthian kingdom. However, the Scythians, and Greek mercenaries, came to the assistance of Antiochus, and falling upon the Parthians, cut their army to pieces, killed their king, and laid waste his dominions. On the departure of the Greeks and Scythians to their own countries, Artabanus I. took possession of the crown, and after a short reign, he was succeeded by his son Pacorus I., who, hearing of the great exploits of the Romans, sent ambassadors to Sylla, who was then in Cappadocia, soliciting the friendship and alliance of so powerful a people. In consequence of this alliance, peace was maintained for some time within the two empires, till at length M. Licinius Crassus, having been created consul at Rome with Pompey, and having, by the Trebonian law, obtained the dominion of Syria, and the neighbouring provinces, was prompted by his insatiable avarice to make war with the Parthians, whose army was entrusted to the command of Surenas. The presumption and ardour of the son of Crassus brought on a battle between the two armies, the event of which proved fatal, not only to the father and son, but to a great number of the Romans. Although the victory was chiefly owing to the skill and valour of Surenas, Orodes, the Parthian monarch,

PARTHIA.

jealous of his fame, perfidiously ordered him to be put to death. After this contest, the Romans and Parthians continued for some time in a state of mutual hostility; the latter having often the advantage, and pursuing their conquests in Syria, Phœnicia, and Asia Minor, &c. At length Ventidius re-established the honour of the Roman arms; and having surprised the Parthians, attacked them at an unfavourable moment, and defeated them; Pacorus, the son of the Parthian king, being killed, whilst he was fighting with incredible bravery at the head of the Parthian horse. Some time after, the Parthians took ample revenge; and Statianus, the lieutenant of Sylla, was cut off with 10,000 Romans. Orodes was assassinated by his son Phraates, who exercised the same cruelty over the nobility, and all the rest of the royal family, not sparing his eldest son, left the discontented Parthians should place him on the throne. This monster prolonged his reign under the character of a warlike prince, and prosecuted a prosperous war against Antony. In process of time he made peace with Augustus, and restored all the captives and ensigns which the Parthians had taken in their wars with Crassus and Antony. He also sent four of his sons, with their wives and children, as hostages to Rome. His son Phraatrus remained with him; and it is said that he was poisoned by his wife Thermosa, in order to place the son upon the throne. The Parthians, however, disdaining to be governed by so wicked a parricide, rose up in arms, and drove him into banishment, where he perished some years after. The succeeding reigns were of short duration; and Artabanus, one of the race of the Arsacides, who reigned in Media, was called to the Parthian throne. His cruelty rendered him detestable, and afforded to Tiberius an opportunity of placing on the throne Tiridates, who was likely to be more devoted to the will of the Roman emperor. Artabanus was ultimately restored to the kingdom by the influence of Izates, king of the Adiabeniens; and from this time he governed the kingdom with great equity and moderation; so that, after a reign of 30 years, he died, greatly lamented by all his subjects, leaving behind him seven sons, one of whom succeeded him. Under the reign of Nero, Vologeses, the Parthian king, sent ambassadors to the emperor, soliciting the kingdom of Armenia, and offering to renew the alliance made by his ancestors with the Roman people. Nero refused to renounce all pretensions to the crown of Armenia. Vologeses was incensed, but dreading the consequence of a war with the Romans, he at last consented that his brother Tiridates should go in person to Rome, and there receive the crown of Armenia, as a gift from Nero, who accordingly bestowed it upon him. Thus the ancient alliance between the two empires was renewed, and the affairs of the East were settled in peace. However, under the reign of Trajan, Armenia became a subject of difference between the two empires. Cosroes, for some reason that is not known, invaded Armenia, and expelled Exadorus, who had been appointed king of that country by the emperor Trajan, and placed his eldest son upon the throne. But Trajan, thus incensed, determined to humble the Parthians, and for this purpose hastened into the East. His journey was so sudden and unexpected, that he reduced the whole country without opposition, and took the Armenian king prisoner. He then entered Mesopotamia, and made himself master of that opulent kingdom, never before subject to Rome, and reduced it to a Roman province. After several contests of various issue, Cosroes was defeated by Lucius, a commander detached for this service by Trajan. The emperor having gained possession of all the best and most fruitful provinces of the Parthian empire, and perceiving that he could not maintain his con-

quests, without great expence and hazard, at such a distance from Italy, he appointed one of the royal family, named Parthaspates, king of Parthia. Thus the Parthians were at last subdued, and their kingdom made tributary to Rome. But, after Trajan's death, they revolted, drove the king whom he had appointed from the throne, and recalled Cosroes, who had retired into the country of the Hyrcanians. Adrian, who was then in the East, thought it imprudent to engage in a new war with the Parthians, but contented himself with making the Euphrates the boundary of the Roman empire. Cosroes died after a long reign, and was succeeded by his son Vologeses II., who invaded Armenia and Syria. Upon this, the emperor Verus, by the advice of his colleague Antoninus, surnamed the philosopher, hastened into Syria; and having forced the Parthians from that province, ordered Statius Priscus to invade Armenia, and Cassius, with Martius Verus, to enter the Parthian territories, and carry the war into the enemy's country. Priscus drove the Parthians, though not without great loss, out of Armenia; and Cassius, having repeatedly defeated Vologeses, though he had an army of 400,000 men under his command, reduced in four years all those provinces which had formerly submitted to Trajan, and gained other considerable advantages. After the revolt and death of Cassius, Antoninus the philosopher repaired into Syria, and having been met by ambassadors from Vologeses, who, being unwilling to part with those provinces that had been subdued by Cassius, but which he had recovered, solicited the emperor to confirm him in the possession of them, promising to acknowledge the sovereignty of Rome. Antoninus readily acceded to these terms, and a peace was concluded between the two empires. Upon the death of Vologeses, another prince of the same name succeeded him; but taking part with Niger, against the emperor Severus, the emperor laid siege to Ctesiphon, his metropolis, and took it. Vologeses, who had made a gallant defence, had the good fortune to escape. As soon as Severus had crossed the Euphrates, Vologeses recovered all the provinces, except Mesopotamia, which he had reduced. The Parthians were molested with intestine disturbances, but Vologeses died before he could restore the empire to its former tranquillity. Before Artabanus IV., the successor of Vologeses, had well settled the affairs of his kingdom, the emperor Caracalla, desirous of signalizing himself by some memorable exploit against the Parthians, sent a solemn embassy to him, desiring his daughter in marriage. Artabanus, rejoicing in the proposal, because he thought the connection would be attended with a lasting peace between the two empires, received the ambassadors with all possible marks of honour, and readily complied with their request. Caracalla, by a second embassy, informed Artabanus, that he was hastening to solemnize the nuptials; upon which the Parthian king, with the chief of the nobility, and his best troops all unarmed, went out to meet him; but the soldiers of the treacherous emperor, on a signal given, fell upon the king's retinue, and made a dreadful slaughter of the unarmed multitude. Artabanus himself escaped with great difficulty. However, he determined to revenge himself on the Romans, for their inhuman and barbarous treachery; and therefore he entered into Syria with a very numerous army, and put all to the sword. This was followed with an obstinate engagement between the Parthian and Roman armies, in which 40,000 on both sides were killed. When Artabanus heard that his great enemy, Caracalla, was dead, he embraced with eagerness the proposals of peace and amity made to him by the new emperor, Meccrenus; and then the one returned to Parthia, and the other to Antioch. Artabanus, being enfeebled by his com-

bat with the Romans, was alarmed by a revolt of the Persians; and prepared, by the whole strength of his kingdom, to suppress it. A bloody battle ensued, and the Parthians, after the most valiant exertions, were forced to yield to the Persians, who were commanded by Artaxerxes, who, though of mean descent, possessed great military experience. The Parthian king was taken prisoner, and soon after put to death by the order of Artaxerxes. The Parthians, having lost their king and their army, were forced to submit to the conqueror, and became vassals to a nation which had been subject to them for the space of 475 years. Thus was this gallant and warlike nation subdued at last, and the empire once more transferred to the Persians. However, the royal family of Arsaces did not end in Artabanus, but continued to reign in Armenia, till the time of the emperor Justinian, holding that kingdom of the Persian monarchs, to whom the Arsacidæ of Armenia were tributaries. See ARSACIDÆ. Anc. Un. Hist. vol. ix.

To this historical account of the Parthians we shall subjoin a concise statement of the geography of their country, more especially as very erroneous ideas concerning the local situation of this country have generally prevailed. Those, whose knowledge of it has been chiefly derived from its wars with the Romans, have conceived Parthia to be only the country bordering on the Euphrates and Tigris; whereas Parthia proper was a small province very near to the S.E. extreme of the Caspian sea, which territory, as we have already historically detailed, after the division of Alexander's empire, fell to the choice of the Seleucidæ, kings of Syria, and of the east, about 300 years before our era. About 50 years after, Parthia rebelled; and together with Hyrcania, and other adjoining provinces, became an independent state under Arsaces. As the empire of the Seleucidæ grew weaker, the Parthians extended their country westward; and the fine province of Media fell to them; and within a century after the foundation of their state, it had swallowed up all the countries from the Indus to the Euphrates, Bactria included: and this province had thrown off the yoke of the Seleucidæ, long before Parthia. The Parthian conquests in Armenia, about 70 years B. C., brought them acquainted with the Romans; whose conquests met theirs both in that country and in Syria. The Parthians, together with their conquests, had advanced their capital westwards, and had established it on the Tigris at Seleucia, or rather Ctesiphon (near the present Bagdad) before their wars with the Romans commenced. The expeditions of Pompey and Antony, and the defeat of Crassus, need not be again recited. On occasion of the last event, the Parthians extended their conquests farther westward, but afterwards were compelled to retire; and they generally lost ground in Armenia and Mesopotamia, during the time of the Roman emperors. Trajan penetrated to their capital; and satisfied his curiosity by embarking on the Indian sea. The moderation of Adrian restored the ancient boundary of the Euphrates. In A.D. 245, Persis, or Persia proper, which had for some ages ranked as a province of Parthia, gained the ascendancy; and, under Artaxerxes, put an end to the dynasty of the Arsacidæ, and restored the ancient name of Persia to the empire, after that of Parthia had existed about 480 years: so that, in fact, the Parthian empire, considered generally, was the Persian, under another name. Rennell's Memoir.

PARTHIA, a town of Asia Minor, in Caria.

PARTI, PARTY, or *Parted*, in *Heraldry*, is applied to a shield or escutcheon, denoting it divided, or marked out into partitions.

The French heralds, from whom we borrow the word,

have but one kind of *parti*, the same with our *parti per pale* which they simply call *parti*: but with us the word is applied to all sorts of partitioning: and is never used without some addition to specify the particular kind intended.

Thus we have *parti*, or *parted per cross*, *per chief*, *per pale*, *per fess*, *per bend dexter*, *per bend sinister*, *per chevron*, &c. See QUARTERING.

The humour of our ancestors, Colmbiere observes, turning much upon exploits of arms and chivalry, they used to preserve their battered and hacked armour as honourable symbols of their hardy deeds; and those who had been in the hottest service were distinguished by the most cuts and bruises that appeared on their shields. To perpetuate the memory hereof, says the same author, they caused them to be painted on their shields, and thus handed down to posterity. And when heraldry grew into an art, and officers were appointed to direct the manner of bearing, and blazoning; they gave names to those cuts, answerable to the nature thereof; appointing four, from which all the others proceed; these are *parti* (called by our heralds, *parti per pale*), *coupe* (*parti per fess*), *tranche* (*parti per bend dexter*), and *taille* (*parti per bend sinister*.) See COUPED, TRANCHE, &c.

PARTI *per pale*. See PALE.

PARTI *per fesse*. See FESSE.

PARTI *per bend dexter*, is when the cut comes from the upper corner of the shield on the right hand, and descends athwart to the opposite lower corner.

PARTI *per bend sinister*, is when the cut coming from the upper left corner, descends across to the opposite lower one.

From these four partitions have proceeded an infinite number of others of various and extravagant forms.

Spelman, in his *Aspilogia*, observes, that the present divisions of escutcheons were unknown in the reign of the emperor Theodosius; and were brought up in the time of Charlemagne, or later; they were little used among the English in the days of king Henry II. but more frequently under Edward III.

The erect or upright section, he observes, is called in Latin *palaris*, from its resemblance to a *palus*, or *stake*; and two coats are often entire on the sides, the husband's on the right, and the wife's on the left. The direct section across, being in the place of a belt, is called *baltica*, &c.

When the shield is *parti*, and *coupée*, it is said to be *ecartelé*.

It is said to be *parti one from the other*, when the whole shield is charged with some honourable bearing divided by the same line that parts the shield. Here it is a rule, that one side be of metal, and the other of colour. Thus he bears sable, parti d'argent, a spread eagle parti from one to the other.

PARTIAL CAUSE. See CAUSE.

PARTIAL Differences, *Theory of*, is one of the higher branches of the modern analysis, for the development of which we are principally indebted to d'Alembert, though the subject had been previously considered, in *abstractio*, by a few other mathematicians, but it does not appear that any of them had any explicit idea of its application.

Fontaine seems to have been the first who prepared and adopted the notation for expressing the partial differences of any variable function; but it is in a memoir of N. Bernoulli, on Trajectories, that we first find an attempt to ascertain the relation that has place between the partial differences of a function of two variable quantities. See Act. Eruditorum, ann 1720, or the works of John Bernoulli, tom. ii.

p. 443.

PARTIAL DIFFERENCE.

Clairaut also discovered the same theorem, of which he availed himself, in two memoirs on the Integral Calculus, printed amongst those of the Academy of Sciences, for the years 1739 and 1740. These memoirs are far more elegant and perspicuous than those of Fontaine, in which this notation is first adopted, and the latter in particular is very interesting: here we find the equation $\frac{dA}{dy} = \frac{dB}{dx}$ drawn from

the consideration of curve surfaces, and some remarks in this paper, first suggested by Fontaine, Lagrange employed as the base of his elegant theory of Particular Integrals, published by him in the Memoirs of Berlin for 1774, and afterwards in his *Leçons des Fonctions*. But of all those who preceded d'Alembert in the theory of partial differences, Euler has perhaps the greatest claim to priority of invention, having completely integrated an equation of this description in 1734, in vol. vii. of the *Acta Petrop.*, but afterwards forgot or neglected his new calculus, not being aware probably of its extensive application to physical problems. This application we owe entirely to d'Alembert, and the great ingenuity and taste displayed in the integration of his equations, cannot fail of placing him amongst the first of modern mathematicians. D'Alembert was first led to this integration on attempting the solution of certain problems relating to the vibration of musical chords, and afterwards employed it with great success in his theory of the winds, the resistance of fluids, and other very difficult and delicate investigations.

Theory of Partial Differences.—Having given a slight sketch of the progress of this interesting branch of analysis, let us now endeavour to explain more particularly the nature of the calculus, and its application in one or two particular cases.

When we have any function z of two variables x and y , or of a greater number, we know that in differencing at first with x as variable and y as constant, and again with y as variable and x as constant, we obtain $dz = p dx + q dy$, p and q being the co-efficients that affect dx and dy respectively. Hence the complete differential of z is $p dx + q dy$; and $p dx$ and $q dy$ the partial differences. This definition is sufficient for our present purpose, which will be farther illustrated in the sequel.

These co-efficients above denoted by p and q , are more commonly denoted by $\frac{dz}{dx}$, $\frac{dz}{dy}$, which are in fact the same; for, if we difference first with x variable and y constant, and divide by dx , we have $\frac{dz}{dx}$, which represents what the function becomes on this supposition, and in the same way $\frac{dz}{dy}$ will represent its value, supposing y variable and x constant; so that the complete value of dz is expressed by $dz = \frac{dz}{dx} dx + \frac{dz}{dy} dy$, and it is commonly under this form that equations of partial differences arise.

Hence every equation between the quantities

$$z, x, y, \frac{dz}{dy}, \frac{dz}{dx}, \text{ \&c.}$$

is called an equation of partial differences, and which may be compounded or not with known quantities: thus, $a \frac{dz}{dx} + b \frac{dz}{dy} - xy = 0$, is an equation of this kind, the

solution and integration of which requires, that we should find such a function of x and y , that the co-efficient of the differential dx plus the co-efficient of the differential dy ; the first multiplied by a and the second by b , may produce xy ; and the method of performing this is what is called the *integral calculus of partial differences*.

$$\text{Again,} \quad \frac{dz}{dx} + \frac{dz}{dy} - x^2 - 4xy - y^2 = 0,$$

is also an equation of partial differences, the integral of which is $z = x^2 y + y^2 x$.

For differencing this first with x variable and y constant, we have $\frac{dz}{dx} = 2xy + y^2$; and again, with y variable and x constant, $\frac{dz}{dy} = x^2 + 2xy$;

$$\text{whence} \quad \frac{dz}{dx} + \frac{dz}{dy} = x^2 + 4xy + y^2$$

$$\text{or} \quad \frac{dz}{dx} + \frac{dz}{dy} - x^2 - 4xy - y^2 = 0,$$

These equations, in which only the first differentials of the variables enter, are the most simple, and are called partial differential equations of the first degree. If the second differentials enter, the equation is said to be of the second degree; if the third enter, of the third degree; and so on of others:

$$\text{thus,} \quad \frac{d^2 z}{dx^2} + \frac{d^2 z}{dx dy} + P = 0,$$

is an equation of the second degree; and

$$\frac{d^3 z}{dx^3} + \frac{d^3 z}{dy^3} + P = 0,$$

is an equation of the third degree, and so on of superior orders; but the first and second are those only that can be employed to any advantage, the integration of the higher orders being too complex to admit of a solution except in a few partial cases: indeed, the complete integrations of equations of the first and second degree, is at present a desideratum of modern analysts.

In the preceding part of this article, we have only mentioned functions of two variables, but it is needless to apprise the reader that the same may have place in those of three or more variable quantities; we have merely limited our observation to those of two, for the sake of greater simplicity.

In the limits to which we are under necessity of confining this article, we cannot enter at any great length upon the method of integrating equations of this kind; but in order to give some idea of it, let us take one of the most simple

cases; viz. $\frac{dz}{dx} = P$, P being any function of x and y , with or without constant or known quantities.

Here, then, our object is to find a function z , of x and y , which being differenced with y as variable, and divided by dy , shall be equal to the given function P . In order to this, let us multiply the whole by dy , and we shall have $\frac{dz}{dy} dy = P dy$, from which it follows that $P dy$ is only a part of the differential of z , viz. that part which arises by considering y as variable; so that the integral of $\frac{dz}{dy} dy$, which is z , (since the expression above results from its differentiation)

PARTIAL DIFFERENCE.

rentiation) in making only y variable, will be equal to $\int P dy$ plus a function which contains only x , and which may be found after the same manner as the correction of any other integral to render it complete from the conditions of the problem.

Let us represent this function of x by $F(x)$, and we shall have $z = \int P dy + F(x)$; and in the same manner, if we had $\frac{dz}{dx} = P$, we should have for a solution $\int P dx + F(y)$.

Suppose, for example, the integration of the equation

$$\frac{dz}{dy} = axy + y^3$$

were required. Here we should have

$$\frac{dz}{dy} dy = axy dy + y^3 dy = P dy,$$

and
$$\int P dy = \frac{axy^2}{2} + \frac{y^4}{4};$$

and as in this expression of P , we have only y variable, we have, as above,

$$z = \frac{axy^2}{2} + \frac{y^4}{4} + F(x).$$

For differencing this with y variable, we obtain again

$$\frac{dz}{dy} = (axy + y^3) dy = P dy$$

$F(x)$ having no differential, from the nature of the equation being considered as constant with regard to y , and as to the particular value of $F(x)$, this must be determined from the nature of the problem from which the equation has been obtained, in the same manner as is found the correction of an integral or fluent.

The next equation to the preceding in the order of difficulty is,

$$\frac{M dz}{dy} + \frac{N dz}{dx} = 0.$$

then again

$$\frac{M dz}{dy} + \frac{N dz}{dx} + Pz = 0;$$

and, finally, the most general of all,

$$\frac{M dz}{dy} + \frac{N dz}{dx} + Pz + Q = 0;$$

in which M, N, P , are any functions of x, y , and constant quantities, and consequently these will be more or less complex, according to the degree of composition of M , &c. But the limits of this article will not allow of our entering more at length upon the integrations of equations of the first order; we can, therefore, only refer the reader for farther information to the "Traité du Calcul Integral" of Cousin and Boffut, and to the "Traité du Calcul Différentiel et du Calcul Integral" by La Croix, and the other works above referred to.

It will be proper, however, before we dismiss this article, to say a few words with regard to partial differential equations of the second degree; all that has been said above being with reference to the first degree only.

We have before observed, that every equation between a function z , of two variables x and y , and its partial differences

$$\frac{dz}{dx}, \frac{dz}{dy}, \frac{d^2z}{dx^2}, \frac{d^2z}{dy^2}, \frac{d^2z}{dx dy},$$

is an equation of partial differences of the second order, and from which an idea may be formed of those of a higher degree, as the third, fourth, or even of the indefinite order n ; as also of those comprehending a greater number of variables, as $x, y, u; x, y, u, t$, &c. We shall here, however, as in the preceding case, limit our remarks to those only of two variables, and of these we shall propose, first, the equation $xy - \frac{dz}{dx} = 0$, this being the simplest partial differential equation of the second degree.

Let it be then proposed to integrate the equation

$$xy - \frac{dz}{dx} = 0.$$

In order to this, make $\frac{dz}{dx} = u$, and we shall thus have

$$\frac{du}{dx} = \frac{dz}{dx^2},$$

considering dx as constant, and thus the proposed equation becomes $xy = \frac{du}{dx}$, or $yx dx = du$.

Integrating now only with regard to x , we shall have $u = \frac{x^2 y}{2} + F(y)$.

But now instead of u put its value $\frac{dz}{dx}$, and we obtain $\frac{dz}{dx} =$

$$\frac{x^2 y}{2} + F(y),$$

which, multiplying by dx , becomes $d^2z = \frac{yx^2 dx}{2} + dx F(y)$, and finally integrating with regard to x only, we have

$$z = \frac{yx^3}{6} + x F(y) + f(y);$$

and that this is the integral sought will appear by differencing again this expression, observing that $y, F(y)$, and $f(y)$, being each considered constant with regard to x , will have no difference; thus

$$dz = \frac{yx^2 dx}{2} + dx F(y),$$

$$\frac{dz}{dx} = \frac{yx^2}{2} + F(y)$$

And differencing again, and making dx constant, we have

$$\frac{d^2z}{dx^2} = \frac{2yx dx}{2} \text{ or } \frac{d^2z}{dx^2} = xy,$$

as first proposed.

Whence it appears, that in equations of the second degree, in order to render the integral complete, we must connect with it two different arbitrary functions of the variable, of which the differential enters not into the given equation, and the particular form of which must be found from the nature of the problem whence the equation is deduced.

If the equation were of the third order, as $xy = \frac{d^2z}{dx^2}$, the

steps of the operation would be nearly the same. Thus in

supposing at first $\frac{d^2z}{dx^2} = u$, we deduce $\frac{d^3z}{dx^3} = \frac{du}{dx}$; and sub-

stituting $\frac{du}{dx}$ in the place of $\frac{d^3z}{dx^3}$, we shall have $xy = \frac{du}{dx}$,

or

or $du = yx dx$; integrating again; $u = \frac{y x^2}{2} + F(y)$; that is $\frac{dz}{dx} = \frac{y x^2}{2} + F(y)$, by which the equation is reduced to the second degree; and in like manner it may now be transformed into one of the first, as

$$\frac{dz}{dx} = \frac{y x^3}{6} + x F(y) + f(y),$$

from which the final integral is obtained as above, *viz.*

$$z = \frac{y x^4}{24} + x^2 F(y) + x f(y) + \phi(y),$$

which may be verified the same as before by taking the successive differences.

If the proposed equation of the second order were

$$\frac{d^2 z}{dx dy} = xy; \text{ we must suppose } \frac{dz}{dy} = u, \text{ and then proceeding as above, we shall find } u \text{ or } \frac{dz}{dy} = \frac{y x^2}{2} + F(y), \text{ and consequently } dz = \frac{x^2 y dy}{2} + dy F(y), \text{ and integrating this again,}$$

$$z = \frac{y^2 x^2}{4} + \int dy F(y) + f(x);$$

or (because $\int dy F(y)$ is itself a function of y)

$$z = \frac{y^2 x^2}{4} + F'(y) + f(x).$$

Lastly, if z was a function, these variables x, y , and u , and the proposed equation for integration, was

$$z y u = \frac{dx dz}{dx dy du} = c,$$

we should find by similar substitutions,

$$z = \frac{x^3 y^2 u^2}{6} + F(y, u) + f(x, y) + \phi(x, u)$$

where the three arbitrary functions, necessary for completing the integral, are those formed from the different combinations of the three variables x, y , and u , taken two and two at a time.

And in a similar manner, the integral of a function consisting of any greater number of variables may be obtained, the number of arbitrary functions being equal to the exponent of the order of the equation.

The integral calculus of partial difference is sometimes considered under a different point of view, which is by finding a function of many variables, when we know the relation of the differential co-efficients of the total differential. The notation employed is also given by some authors, rather different from that given above, but our limits will not admit of entering, in this place, into any farther explanation; we shall, therefore, conclude this article with an enumeration of the principal memoirs and works on this interesting subject, not mentioned in the preceding part of this article, and to which the reader is referred for more complete information; *viz.* Lagrange Memoirs of Berlin, 1774, 1775; Leçons sur le Calcul des Fonctions by the same author; Legendre Memoirs de l'Académie de Paris 1787; La Place Memoirs de l'Académie 1773; and in various parts of his Méchanique Céleste. Condorcet Memoirs de l'Académie des Sciences for the years 1770, 1771, and 1772; Monge Memoirs presented to the Academy of Sciences, vols. vii. and ix. and in vol. iv. of the Memoirs of the Academy of Turin; Bossut,

Traité du Calcul Integral; Coufin, Traité Calcul Integral; La Croix Traité du Calcul Differentiel, et du Calcul Integral; Paoli Elementi d'Algebra, and the article *Integral Calcul des Differentiel Partielles*, Encyclopédie Methodique. We cannot but regret, that in this enumeration, we are under the necessity of confining our references to foreign works only; no English author, to the best of our knowledge, having any where attempted an investigation or illustration of this difficult branch of analysis.

PARTIAL Eclipse. See ECLIPSE.

PARTICIPATION, PARTICIPATIO, that which gives us a part or share in any thing, either by right or grace.

In Italy, they distinguish *participating* officers, as prothonotaries, &c. which have a real function; from *honorary* ones, which have only a title, without any duty or employ.

PARTICIPATION, in *Musick*, in the tuning of keyed instruments, implies equal harmony; that is, dividing the imperfections of the scale equally among all the sounds of the system. By this means the 5ths are better, and the sharp 3ds worse, than in common tuning, when there is a *wolf*. (See WOLF.) This manner of tuning seems necessary now, and to be generally received; as modulation is so licentious, that in a long movement it is impossible, by relative sounds, for the performer to guess where he shall be carried, as every key, and every chord on the instrument, are sure to be called into use before the final close in the original key. In making all the 5ths perfect, there is a redundancy of a half tone. Now, if that is divided into twelve parts among all the semitones, it should seem as if no one key would suffer much; yet an ear not accustomed to such harsh major 3ds, is at first much offended.

PARTICIPATIONIS MEDIUM. See MEDIUM.

PARTIPATO, Ital. see TEMPERAMENT. Participation is likewise a mixture of the diatonic and chromatic genera in the music of the ancients, according to Padre Martini. We may, indeed, say that all modulation in modern music is brought about by the mixture or participation of the diatonic and chromatic genera. The rising or falling by minor semitones is chromatic. So that in the key of C natural, an F which modulates into G is chromatic.

PARTICIPLE, PARTICIPIUM, in *Grammar*, an adjective formed of a verb; so called because it still participates of some of the properties of the verb; retaining the regimen and signification of it: whence most authors confound it with the verb.

Mr. Harris observes, that, as a complete verb is expressive of an attribute, of time, and of an assertion, if we take away the assertion, there will remain the attribute and the time, which make the essence of a participle. There are two kinds of participles, the one called *active*, because expressing the subject which makes the action of the verb; as *legens, audiens, reading, bearing*. The other called *passive*, because expressing the subject that receives the action of the verb; as *lectum, auditum, read, heard*.

As our adjectives are not declined, the participles, being real adjectives, are also not declined: in the Latin, &c. where the adjectives are declined, the participles active are declined likewise. Thus they say *audiens, audientis, audienti*, &c. and in the French the participles passive are declinable like their adjectives, as *j'ay lu, elle a lue, nous avons lus*, &c.

In our language, the participles and gerunds are not at all distinguishable.

The English grammar lays down a good rule with respect to its participle of the past, that they all terminate in *d, t, or n*; which analogy is liable to as few exceptions as any.

PARTICLE, PARTICULA, in *Physics*, the minute part of

of a body, or an assemblage or coalition of several of the atoms of which natural bodies are composed.

PARTICLE, in *Physics* and *Chemistry*. Those minute parts of matter, by which bodies are constituted, are called atoms or particles of simple bodies. The particles of simple bodies are unchangeable under all circumstances, so far as regards their weight and figure. The changes which bodies undergo by heat and chemical attraction, are to be ascribed only to a change of distance and arrangement of their unalterable atoms. Mathematicians may prove the infinite divisibility of matter, but nature has evidently given limits to this division. Without such limitation there would be no definite point for the commencement of compoundability, and the number and variety of compounds would be infinite. Nothing, however, is more clearly proved, than that the number and proportions of compounds are limited. This alone is sufficient to establish the following facts, that simple bodies are constituted by strictly similar atoms, which are unalterable in figure, size, and weight: that compound bodies are constituted by compound particles, which are equally unchangeable by heat or mechanical action, so long as they remain combined: and that their decomposition consists in the operation of their simple atoms. When chemists have ascertained the relative weights of the simple atoms, which is no difficult task, the proportions of all compounds will be known without the aid of experiment, and chemistry will stand on as firm a basis as mechanical science. Although we are indebted to Dalton for this beautiful system of chemical philosophy, the principles on which it is founded did not escape the penetrating eye of Newton. We find the following observations at the latter end of his 31st query.

“All these things being considered, it seems probable to me, that God in the beginning formed matter in solid, massy, hard, impenetrable, moveable particles, of such sizes and figures, and with such other properties, and in such proportion to space, as most conduced to the end for which he formed them; and these primitive particles being solids, are incomparably harder than any porous bodies compounded of them, even so very hard as never to wear or break in pieces: no ordinary power being able to divide what God himself made one in the first creation. While the particles continue entire, they may compose bodies of one and the same nature and texture in all ages; but should they wear away, or break to pieces, the nature of things depending upon them would be changed. Water and earth, composed of old worn particles, and fragments of particles, would not be of the same nature and texture now with water and earth composed of entire particles in the beginning: and, therefore, that nature may be lasting, the changes of corporeal things are to be placed only in the various separations and new associations, and motions of these permanent particles, compound bodies being apt to break, not in the midst of solid particles, but where those particles are laid together, and only touch in a few points.” He farther supposes that these primitive particles may act upon each other by laws similar to gravity, which determines the motions of masses of matter. We may, perhaps, at some period find, that chemical affinity, or that power by which the particles of simple matter act upon each other, may be no more than the force of gravity, acting upon each other at such small distances, as to make their attractions equal to greater masses at greater distances. The primitive particles, even when their weights are the same, may attract other matter with very different forces, by being of different degrees of density. The attraction of one particle for another would be as their weights, and as the squares of their diameters inversely. For instance, the atom of copper appears to be nearly of the same weight with an atom of zinc,

but their attraction for oxygen are very different. If, then, chemical affinity be of the same force with gravity, we must suppose the atom of zinc to be denser than the atom of copper in the ratio of their affinity for oxygen. If the relative affinities of bodies can be known, and can be proved of the same force with gravity; the relative density, as well as the relative weight of the atoms of bodies, may be known. A view of the Daltonian theory, with more particulars on this interesting subject, will be given under the article **PROPORTIONS definite of chemical compounds**.

The cohesion of the particles of matter, the Epicureans imagined, was effected by means of hooked atoms; the Aristotelians by rest, that is, by nothing at all. But sir Isaac Newton shews it is done by means of a certain power by which the particles mutually attract, or tend towards each other.

By this attraction of the particles he shews that most of the phenomena of the lesser bodies are effected; as those of the heavenly bodies are by the attraction of gravity.

PARTICLES, for the laws of this attraction of the. See **ATTRACTION** and **COHESION**.

All bodies, the same great author shews, consist of the same solid, perfectly hard particles or corpuscles.

PARTICLE, in *Grammar*, denotes a little indeclinable word, consisting of one or two syllables at the most.

Those are properly particles which are neither declined nor conjugated.

Brightland calls particles, *manners of words*, because they rather serve to express the circumstances and manners of other ideas and objects of the mind, than to represent any distinct objects of their own.

Particles may be reduced under three heads: the first shew the manners or qualities of words, by being added to them; called *adverbs*.

The second denote some circumstances of actions, and join words to words, sentence to sentence, &c. See **CONJUNCTION**.

The third express the emotions of the soul. See **INTERJECTION**.

It is in the right use of particles, Mr. Locke observes, that more particularly consist the clearness and beauty of a good style. To express the dependence of his thoughts and reasonings one upon another, a man must have words to shew what connection, restriction, distinction, opposition, emphasis, &c. he gives to each respective part of his discourse. This cannot be rightly understood without a clear view of the postures, stands, turns, limitations, exceptions, and several other thoughts of the mind. Of these there is a great variety, much exceeding the number of particles that most languages have to express them by; for which reason it happens that most of these particles have divers, and sometimes almost opposite significations. Thus the particle *but*, in English, has several very different significations: as in, *but* to say no more, where it intimates a stop of mind in the course it was going, before it came to the end of it. I saw *but* two planets; here it shews, that the mind limits the sense to what is expressed with a negation of all other. You pray, *but* it is not that God would bring you to the true religion, *but* that he would confirm you in your own: the former of these intimates a supposition in the mind, of something otherwise than it should; the latter shews, that the mind makes a direct opposition between that and what goes before. All animals have sense, *but* a dog is an animal: here it signifies the connection of the latter proposition with the former.

PARTICLES is also a term in *Theology*, used in the Latin church for the crumbs or little pieces of consecrated bread, called *μικροδες* in the Greek church.

In the Greek church they have a particular ceremony, called *των μεριδων*, of the particles, wherein certain crumbs of bread, not consecrated, are offered up in honour of the Virgin, St. John Baptist, and several other saints. They also give the name *προσφορα*, oblation, to these particles.

Gabriel, archbishop of Philadelphia, has a little treatise express, *περι των μεριδων*, wherein he endeavours to shew the antiquity of this ceremony, in that it is mentioned in the liturgies of St. Chrysostom and Basil.

There has been a considerable dispute on this head, between the Reformed and the Catholic divines. Aubertin and Blondel explain a passage in the theory of Germanus, patriarch of Constantinople, where he mentions the ceremony of the particles as in use in his time; in favour of the former: Messieurs de Port Royal contest the explanation: but M. Simon, in his notes on Gabriel of Philadelphia, endeavours to shew, that the passage itself is an interpolation; not being found in the ancient copies of Germanus: and consequently that the dispute is very ill grounded.

PARTICLE out of Share, in *Astronomy*. See PARTICULA *Exfors*.

PARTICOTTY, in *Geography*, a town of Hindoostan, in the Carnatic; 7 miles N.E. of Tinevelly.

PARTICULA EXFORS, in *Astronomy*, the difference between the equatorial triangle L A C (*Plate XVIII. Astron. fig. 16.*) and its fellow B L Z.

To find the particula exfors, the mensural eccentricity A C, and the annual argument of the longitude H A D, being given; from the data in the triangle B C A, find the hypothenuse A B to the angle C, and to the angle C A B, find the subtense C B. Multiply C B into half the mensural eccentricity A C; the product is the area of the triangle A C B. Find likewise the area of a circle described by the radius of the eccentric B L. Then as the area of the circle is to 360° or 129600"; so is the area of the triangle A C B to its value in those seconds: which value is the particula exfors.

PARTICULAR, PARTICULARIS, a relative term referring to species, or individual; and opposed to general, or universal. See GENERAL, &c.

In the schools, particular is defined to be something included under an universal; as man under animal.

Though sometimes it is also taken for an individual, as Peter.

There is a difference between particular and singular, that particular denotes a thing taken as a part; as Peter in respect of mankind: whereas singular denotes the part taken after the manner of a whole; as Peter considered in himself.

PARTICULAR averment, character, geography, gravity, maps, nature, proposition, quality, rheumatism, tenant, theorem, and winds. See the several substantives.

PARTICULAR Estate, in *Law*. See REMAINDER.

PARTICULAR Integral, in the *Integral Calculus*, is that which arises in the integration of a given differential equation, by giving a particular value to the arbitrary quantity or quantities that enter into the general integral.

Thus, for example, in the equation

$$y = \frac{2x dy}{dx} - \frac{y dy^2}{dx^2},$$

the general integral is

$$y = 4m(x - m);$$

and by taking $m = 1$, we have

$$y = 4(x - 1),$$

which is a *particular integral*.

We call also a particular integral, that which is obtained by means of an equation of inferior dimensions; thus in the above, if we make $x = y$, we shall have

$$y = \frac{2y dy}{dy} - \frac{y dy^2}{dy^2} = 2y - y,$$

which obviously answers the conditions of the equation.

So likewise in the equation

$$x dx + y dy = dy \sqrt{x^2 + y^2 - a^2}$$

we see immediately, that $x^2 + y^2 = a^2$, will answer the conditions, and is therefore called by some authors a particular integral.

But neither this equation $x^2 + y^2 = a^2$, nor that obtained above, *viz.* $x = y$, is deducible from the general integration of their respective equations, and they therefore thus far differ from those integrals defined above, which arise out of the general integration, by giving to the arbitrary quantity some particular and definite value.

The term particular integral, then, though sufficiently expressive for either of these cases, ought not to be employed for both, and accordingly some authors distinguish the two cases as follows; they call a *complete integral* that which is drawn from the general integration; an *incomplete integral*, that which is found, as in the latter of the above equations, by means of an equation of inferior dimensions; and lastly, a *particular integral*, that which arises by giving to the indeterminate quantity in the general integral some particular determinate value. But Lagrange, in his *Leçons*, as also in his *Theorie des Fonctions Analytiques*, instead of incomplete integrals, used the term *valeurs singuliere*.

One of the most remarkable cases of these incomplete integrals was first noticed by Clairaut. He observed there are some differential equations of the first degree, of which the integration is attended with considerable difficulty by proceeding in the usual manner, which may sometimes be found by a second differentiation, instead of leading us farther from it, as in the usual cases. Such is the differential equation

$$y dx - x dy = a \sqrt{dx^2 + dy^2}$$

to which we are led in the solution of the following geometrical problem. A point being given to find a curve line such, that drawing to this line a tangent, and from the given point on the tangent a normal, it shall be always of the same length. We may arrive at the solution of this problem, by supposing $y = u \sqrt{a^2 - x^2}$, and separating the variables u and x , which ultimately produces the equation

$$\frac{du}{\sqrt{u^2 - 1}} = \frac{dx}{\sqrt{a^2 - x^2}}$$

But by differencing we are led to the solution in a much more simple manner; for if, in order to simplify the differentiation, we make $dx = p dy$, the above equation,

$$y dx - x dy = a \sqrt{dx^2 + dy^2},$$

$$y = px + a \sqrt{1 + p^2};$$

which, although in appearance an equation in finite terms, is

still a differential equation, because $p = \frac{dx}{dy}$. If now we

difference this equation again, we shall have

$$dy = p dx + x dp + \frac{ap dp}{\sqrt{1 + p^2}},$$

which, because $dy = p dx$, gives

$$0 = x dp + \frac{ap dp}{\sqrt{1 + p^2}}$$

and dividing by $d p$, we have

$$0 = x + \frac{a p}{\sqrt{(1+p^2)}}, \text{ or } x = -\frac{a p}{\sqrt{(1+p^2)}};$$

and, lastly, if in the above equation

$$y = p x + a \sqrt{(1+p^2)}$$

we put instead of $p x$ its proper value, as before determined,

$$\text{we find } y = \frac{a}{\sqrt{(1+p^2)}}.$$

Now, if by means of these two values of x and y , we eliminate p , we shall find ultimately

$$x^2 + y^2 = a^2,$$

which is the equation to the circle the curve required, as is obvious, on the slightest consideration of the nature of the problem. It is to be observed, however, that this question admits of another solution, which arises also out of the equa-

tion $x d p + \frac{a p d p}{\sqrt{(1+p^2)}} = 0$, by making $d p = 0$, whence

it follows that p is any constant quantity $= n$, that is $\frac{d x}{d y}$

a constant quantity, which shews it to be a right line; and because of the indeterminate n , an infinite number of right lines will equally answer the conditions of the equation; and this last is one of those cases of particular integrals, as above defined.

Euler has proposed many equations of this kind, which he was led to in the solution of certain geometrical problems, which he had proposed to himself; as also many others, which belong more directly to the cases of incomplete integrals, or singular values mentioned in the second case above; such are

$$x d x + y d y = a \sqrt{(x^2 + y^2 - a^2)},$$

in which the singular value is $x^2 + y^2 = a^2$, an equation to the circle: but in the complete integral, viz. $y + c = \sqrt{(x^2 + y^2 - a^2)}$, we can by no means arrive at the first equation.

This and some other cases mentioned by Euler were considered by that celebrated analyst as insolvable paradoxes; but Lagrange, in the Memoirs of Berlin for 1774, has explained this apparent anomaly nearly as follows.

The integral of a differential equation between two variables, contains one constant arbitrary quantity. If we regard these variables as the rectangular co-ordinates of a curve line, referred to some determined axis, it is obvious that we may imagine as many different curves to be described, all particular integrals of the proposed equation, as we can give different values to the constant arbitrary quantity, that is, we may have an infinite number. How if it happens that these curves have one constant quantity common to them all, the equation of this common tangent ought to satisfy the differential equation proposed; because some one element of this tangent is confounded with some of the elements of the curves: fill this tangent forms no part of the curves, and therefore ought not to be contained in the complete integral, but in an incomplete integral, as above defined; See Memoirs of Berlin for 1774; the Theorie des Fonctions Analytiques, and the Leçons des Fonctions, by Lagrange; the article *Integrals Particulieres*, Encyclopédie Methodique, and *Monucla Histoire des Mathematique*, tome iii. p.180.

PARTICULARIST, among *Polemical Divines*, a person who maintains particular grace, i. e. who teaches or be-

lieves, that Christ died for the elect only; and not for mankind in general. See GRACE.

PARTIDO, in *Geography*, a small island, under the hill of St. Martin, in the S.W. part of Campeachy gulf.—Also, a river of Mexico, which runs into the Pacific ocean, S. lat. 11° 20'.

PARTIE, Fr. *Part*, in English implies the melody or notes allotted to a single voice, or instrument, many of which parts constitute a chorus, symphony, or concerto. Three sounds, at least, are necessary to form a chord; but a complete chord built on the generator or fundamental base with its 3d, 5th, and 8th; and each of these sounds distributed into different parts, would furnish a first treble, second treble, tenor, and base. The high notes in most instruments played with a bow have no bounds, as the perfected audience can tell; but below there is a *ne plus ultra*. Violins can go no lower than G on the fourth space in the base, the tenor to C, unison with the second space in the base, and the violoncello to double C.

PARTIES, in *Law*, are those who are named in a deed, or fine, as parties to it; e. gr. those who levy the fine, and to whom the fine is levied.

So they who make any deed, and they to whom it is made, are both called parties to the deed.

PARTILE ASPECT, in *Astrology*. See ASPECT.

PARTING, in the art of refining metals, is a process by which gold is separated from silver. When those metals which are oxydable in the cupel have been separated from gold, the silver not undergoing that change remains alloyed with it. This is always the case in refining jewellers' gold. In order to separate the silver, the alloy is first rolled into very thin plates, the thinner the better; these plates are to be boiled with pure nitric acid. By this means, the silver is dissolved by the nitric acid, giving to the plates a corroded appearance, as if perforated with a small instrument. When the silver ceases to be dissolved, the plates are to be melted. If the gold is required of greater purity, it may be rolled in plates, and exposed to the acid a second time. If the nitric acid contains any muriatic acid, which is generally the case with the acid of commerce, some of the gold will always be dissolved. Should this be the case, the silver should first be precipitated in the form of muriat, with common salt, and the gold afterwards thrown down with green sulphat of iron.

The most effectual method of separating gold from silver is to dissolve the whole of the thin plates in nitro-muriatic acid. The silver will be found at the bottom of the vessel in the form of muriat, while the gold remains in solution, and may be precipitated with sulphat of iron. The silver may be obtained by heating the muriat with soda in a crucible. The muriat of soda sublimes, while the silver is left pure. See ASSAYING.

PARTING, *Dry*, or parting by fusion, is performed by sulphur, which has the property of uniting easily with silver, while it does not attack gold. The most advantageous method, says Dr. Lewis, of separating a small portion of gold from a large one of silver, appears to be by means of sulphur, which unites with and scorifies the silver without affecting the gold: but as sulphurated silver does not flow thin enough to suffer the small particles of gold diffused through it to re-unite and settle at the bottom, some addition is necessary for collecting and carrying them down.

In order to the commixture with the sulphur, fifty or sixty pounds of the mixed metal, or as much as a large crucible will receive, are melted at once, and reduced into grains by lading out the fluid matter, with a small crucible made red-hot, and pouring it into cold water stirred

with a rapid circular motion. From an eighth to a fifth of the granulated metal, according as it is richer or poorer in gold, is reserved; and the rest well mingled with an eighth of powdered sulphur. The grains enveloped with the sulphur are again put into the crucible, and the fire kept gentle for some time, that the silver, before it melts, may be thoroughly penetrated by the sulphur; if the fire was hastily urged, great part of the sulphur would be dissipated without acting upon the metal.

If to fulphurated silver in fusion pure silver be added, the latter falls to the bottom, and forms there a distinct fluid, not miscible with the other. The particles of gold, having no affinity with the sulphurated silver, join themselves to the pure silver, wherever they come in contact with it, and are thus transferred from the former into the latter, more or less perfectly according as the pure silver was more or less thoroughly diffused through the mixed. It is for this use that a part of the granulated metal was reserved. The sulphurated mass being brought into perfect fusion, and kept melted for near an hour in a close covered crucible, one-third of the reserved grains is thrown in; and as soon as this is melted, the whole is well stirred, that the fresh silver may be distributed through the mixed, to collect the gold from it. The stirring is performed with a wooden rod; an iron one would be corroded by the sulphur, so as to deprive the mixed of its due quantity of sulphur, and likewise render the subsequent purification of the silver more troublesome. The fusion being continued an hour longer, another third of the unfulphurated grains is added, and an hour after this the remainder; after which the fusion is farther continued for some time, the matter being stirred at least every half hour from the beginning to the end, and the crucible kept closely covered in the intervals.

The sulphurated silver appears in fusion of a dark brown colour: after it has been kept melted for a certain time, a part of the sulphur having escaped from the top, the surface becomes white, and some bright drops of silver, about the size of peas, are perceived on it. When this happens, which is commonly in about three hours after the last addition of the reserved grains, sooner or later, according as the crucible has been more or less closely covered, and the matter more or less stirred, the fire must be immediately discontinued; for otherwise more and more of the silver, thus losing its sulphur, would subside and mingle with the part at the bottom in which the gold is collected. The whole is poured out into an iron mortar greased and duly heated; or if the quantity is too large to be safely lifted at once, a part is first laded out from the top with a small crucible, and the rest poured into the mortar. The gold, diffused at first through the whole mass, is now found collected into a part of it at the bottom, amounting only to about as much as was reserved unfulphurated. This part may be separated from the sulphurated silver above it by a chisel and hammer; or more perfectly, the surface of the lower mass being generally rugged and unequal, by placing the whole mass with its bottom upwards in a crucible: the sulphurated part quickly melts, leaving unmelted that which contains the gold, which may thus be completely separated from the other. The sulphurated silver is assayed, by keeping a portion of it in fusion in an open crucible, till the sulphur is dissipated; and then dissolving it in aqua fortis. If it should still be found to contain any gold, it is to be melted again; as much more unfulphurated silver is to be added as was employed in each of the former injections, and the fusion continued about an hour and a half.

The gold thus collected into a part of the silver may be

farther concentrated into a smaller part, by granulating the mass and separating the whole process. The operation may be again and again repeated, till so much of the silver is separated, that the remainder may be parted by aqua fortis without too much expence.

The foregoing process, according to Mr. Schlutter, is practised at Rammelsberg, in the Lower Hartz. The prevailing metal in the ore of Rammelsberg is lead: the quantity of lead is at most forty pounds in a quintal or hundred pounds of the ore. The lead worked off on a test or concave hearth yields about a hundred and ten grains of silver, and the silver contains only a three hundred and eighty-fourth part of gold; yet this little quantity of gold, amounting scarcely to a third of a grain in a hundred weight of the ore, is thus collected with profit. The author above mentioned confines this method of separation to such silver as is poor in gold, and reckons parting with aqua fortis more advantageous where the gold amounts to above a sixty-fourth of the silver: he advises also not to attempt concentrating the gold too far, as a portion of it will always be taken up again by the silver. Mr. Scheffer, however, relates (in the Swedish Memoirs for the year 1752), that he has by this method brought the gold to perfect fineness; and that he has likewise collected all the gold which the silver contained; the silver of the last operations, which had taken up a portion of the gold, being reserved to be worked over again with a fresh quantity of gold-holding silver. The sulphurated silver is purified by continuing it in fusion for some time with a large surface exposed to the air; the sulphur gradually exhales, and leaves the silver entire. Lewis's Comp. Phil. Techn. p. 161, &c. See GOLD and REFINING.

PARTING-Glasses are used in the operation of parting: they have the form of truncated cones, the bottom being commonly about seven inches wide, the aperture about one or two inches wide, and the height about twelve inches. These glass vessels ought to have been well annealed, and chosen free from flaws; as one of the chief inconveniences attending the operation is, that the glasses are apt to crack by exposure to cold, and even when touched by the hand. Some operators secure their glasses by a coating. For this purpose they spread a mixture of quick lime slaked with beer and whites of eggs upon linen cloth, which they wrap round the lower part of the vessel, leaving the upper part uncovered, that they may see the progress of the operation; and over this cloth they apply a composition of clay and hair. Schlutter advises to put the parting-glasses in copper vessels containing some water, and supported by trevets, with fire under them. When the heat communicated by the water is too great, it may be diminished by adding cold water, which must be done very carefully by pouring against the sides of the pan, to prevent too sudden an application of cold to the parting-glass. The intention of this contrivance is, that the contents of the glasses, if these should break, may be received by the copper vessel. Into a glass fifteen inches high, and ten or twelve inches wide at bottom, placed in a copper pan twelve inches wide at bottom, fifteen inches wide at top, and ten inches high, he usually put about eighty ounces of metal, with twice as much aqua fortis.

PARTING Roots, in Gardening, the practice of dividing the roots of some sorts of plants in order to their being set out; which is an expeditious mode of increasing a great number of fibrous-rooted perennial plants. A great number of herbaceous, fibrous, and tuberous-rooted perennial plants often increase by the root into large clusters or bunches, composed of numerous small slips or offsets, particularly

ticularly many of the flowery tribe, such as the campanula, perennial sun-flower, golden-rod, perennial aster, polyanthus, and daisy, balm, mint, burnet, cives, and pennyroyal, with innumerable other sorts; which from one small slip or offset of the root, often in a season or two multiply into a large cluster of such offsets; and these clusters of roots being parted into several separate slips, with root-fibres at their bottom, and one or more buds at top, each commences a distinct plant; so that, by parting the roots in this way, one plant may instantly be multiplied into many, each of which becomes alike in growth and general habit to the original, and all flower in the ensuing season in their due course; and in their turns detach from their sides all around, a due supply of offsets for further propagation.

Commonly the best general season for parting roots is in the latter end of summer or autumn, after they have done flowering, and the stalks are decayed; which is in August, and the two following months; in which, when the detached offsets are planted directly, they will take good root before winter. But in many hardy sorts it may be performed almost any time, in open weather, from September till March; and some of the tender kinds succeed best in spring. In these cases it should, however, be done before they begin to shoot forth their stalks or advance considerably in their spring shoots.

In performing the business, when any plant designed to be increased has multiplied by its roots into a cluster of offsets, the whole may be either taken up entirely, and the root parted into as many slips as are furnished with fibres, &c., or a quantity of slips may be detached from the sides all around as the parent plant stands in the ground: in either method, the work may in many sorts be effected easily with the hand; and in others by the assistance of a knife, &c. And when it is wanted to make as great an increase as possible, the root may be parted into as many slips as may be convenient, provided each is furnished with some fibre or root-part, and crowned with one or more buds or eyes for forming shoots at top. But in the flowery tribe, when the detached offsets are wanted for flowering as strong as possible the ensuing season, they should not be parted too small, but into middling-sized slips, where practicable; which being planted in the proper places will flower in tolerable perfection in the following season. The slips should generally be planted directly by dibble; the very small ones in nursery-beds to stand till next autumn, to acquire strength: then transplanted with balls into the places where they are to remain; but the larger ones at once where they are to grow.

This method may be practised in many sorts annually, as numbers of the herbaceous perennials multiply in one season into large bunches.

PARTING, in *Sea Language*, denotes the state of being driven from the anchors, when the ship has broke her cable by the violence of the wind, waves, or current, or all of them together.

PARTISAN, in the *Military Art*, the commander of a partisan-party.

PARTISAN-Party, a small body of infantry, light horse, and hussars, given to a partisan, to make an incursion upon the enemy, to lurk about their camp, to disturb their foragers, to interrupt their convoys, and to procure intelligence.

PARTISAN has been also applied to a halberd or pike, and to a marshal's staff.

PARTITI, Ital. in *Music*, the score of a composition separated or drawn out in single parts.

PARTITION, the act of parting, dividing, or distributing, a thing.

The denomination *partitiones oratorie* is also given to a dialogue of Cicero's, between him and his son; in regard the discourse is, as it were, parted or divided between them.

PARTITION, in *Architecture*, that which divides or separates one room or apartment from another.

PARTITION, in *Heraldry*. See **QUARTERING**.

PARTITION, in *Husbandry*. The partitions in land sown with wheat by the drill, for the horse-hoeing husbandry, are different according as the wheat is sown, in double, treble, or quadruple rows. The double row has but one partition, and this is best to be used in cases where the land is suspected to be full of the seed of weeds, which must be taken out with the hand-hoe. This partition should be twelve or fourteen inches wide. Whole fields drilled in these rows might formerly have been hand-hoed at the expence of four shillings an acre; and when there is but one foot in six, the price of that work ought to be proportionable.

The common width of the two partitions, when the wheat is sown in treble rows, is six or eight inches. Care is to be taken in this particular; for if they are planted closer, they will starve one another before the intervals are hoed to give them a fresh supply of nourishment; and, if they are planted too far asunder, the two outer rows will thrive well, but the middle row will be starved, and look worse and weaker, because of its being at so great a distance from the hoed intervals.

In quadruple rows, the partitions are best to be seven inches wide each: at this distance the plants will thrive sufficiently, and if they are set nearer, the whole will be worse; and, if farther off the two outer rows will thrive, but the two inner ones will be starved, by reason of their distance from the ploughed intervals. See **ALLEY**, and **HUSBANDRY**.

PARTITION, in *Law*, a dividing of lands descended by common law, or custom, among coheirs, where there are two at least.

The partition is made several ways; whereof four are by agreement, and one by compulsion.

The first partition by agreement is, when the parceners divide the land equally themselves into so many parts as there are coheirs: and each has a determinate part.

The second is, when they agree to choose some of their friends to make the division for them: and each takes a part according to seniority of age, or otherwise, as shall be agreed. In this case seniority is personal; so that if the eldest sister be dead, the next sister, and not the issue of the first, chooses. However, with respect to an advowson it is otherwise: the eldest and her issue, and even her husband, or her assigns, shall present alone, before the younger.

The third method of partition is, when the eldest divides, but chooses last.

The fourth is by drawing lots, thus: having first divided the land into as many parts as there are persons, they write every part severally in a distinct scroll, and, wrapping it up, throw each into a hat, or such a thing; out of which each one draws according to superiority; and so the land is severally allotted.

The other partition, which is by compulsion, is, when one or more of the heirs, by reason of the refusal of some other, sues out a writ of *partitione facienda*, upon which the sheriff shall go to the lands, and make partition thereof by a verdict of the jury there impanelled; and assign to each of the parceners her part in severalty. In Kent, where land is of gavel-kind nature, they call their partition, shifting.

Partition

Partition also may be made by joint-tenants, and tenants in common, by assent, by deed, or by writ. By the 8 & 9 W. c. 31. it is enacted, that if the high sheriff cannot conveniently be present at the execution of any judgment in partition, in such case the under sheriff, in presence of two justices, may proceed to execution of the writ of partition.

PARTITION, in *Music*, is the disposition of the several parts of a song, set on the same leaf; so as upon the uppermost ranges of lines are found the treble; in another the bass; in another the tenor, &c. that they may be all sung or played either jointly or separately.

PARTITION, *Partitio*, in *Rhetoric*, otherwise called enumeration, is that part in which the orator acquaints his hearers with the several parts of his discourse upon which he designs to treat. Some also comprehend under this head separation, in which the orator shews in what he agrees with his adversary, and wherein he differs from him. The requisites of a good partition are the following: it must be short, so that each proposition contains in it nothing more than what is necessary; it ought to be complete, no necessary part being omitted in the enumeration; and it should consist of as few members as is consistent with the nature of the subject. The ancient rhetoricians prescribe three or four at the most; and Cicero never exceeds that number. It may be afterwards convenient to divide these general heads of a discourse, or at least some of them, into several parts or members: and this is best done as the speaker comes to each of them, in the order at first laid down. Instances of this kind occur in Cicero's oration for the Manilian law.

A good partition is attended with considerable advantages; it gives light and ornament to a discourse, and affords great relief and assistance to the hearers. However, some orations, particularly of the demonstrative kind, do not require any particular proposition, being little more than a continued narrative or illustration of the subject. Ward's Orat. vol. i. p. 210, &c.

PARTITIONE FACIENDA, in *Law*, a writ which lies for those who hold lands or tenements *pro indiviso*, and would sever to every one his part, against them that refuse to join in partition, as copartners, &c. F. N. B. 61. 31 H. VIII. cap. 1. Cowel.

PARTITURA, Ital., *Partition*, Fr., in *Music*, implies a *score*, or the several parts of a composition arranged over each other, and separated into equal portions of time by *bars*, or perpendicular lines drawn through all the parts; whence the word *score*.

PARTIUM PRECE. See PRECE.

PARTNER, and PARTNERSHIP. See COMPANY, CO-PARCENER, and FELLOWSHIP.

PARTNERS, in a *Ship*, are strong pieces of timber nailed round the several scuttles, or holes, in a ship's deck, wherein are contained the masts and capsterns. They are used to strengthen the deck, where it is weakened by such breaches, but particularly to support it when the mast leans against it, as impressed by a weight of sail, or when the capstern bears forcibly upon it, whilst charged with a great effort.

Some ships do not sail well unless their masts are loose, and have leave to play in the partners; but in a storm, this is dangerous, lest the partners should be wronged (as they say), *i. e.* forced out of their places; for then there is no help but to cut the mast by the board.

PARTNERS is also a name given occasionally to the scuttles themselves, wherein the masts and capsterns are fixed.

PAR-TOUT. See PASS-PAR-TOUT.

PARTRIDGE, *PERDIX*, the tetrao perdix of Linnæus,

in *Ornithology*, a bird well known and esteemed at table. See TETRAO *Perdix*.

The partridge is a timorous and simple bird, and yet so valuable at the table, that there are a great many ways of taking it invented by sportsmen, all of which succeed from the folly and fear of the animal.

The places which partridges most delight in are corn-fields, especially while the corn grows; for that is a safe retreat, where they remain undisturbed, and under which they usually breed. They frequent the same fields after the corn is cut down, and that with another intent; for they then feed on the corn that has fallen from the ears, and find a sufficient shelter for them under cover of the stalks, especially those of wheat stubble. When the wheat stubble is much trodden by men or beasts, they retire to the barley stubble, and will there hide themselves in coverts of twenty or thirty. When the winter comes on, and the stubble fields are trodden down or ploughed up, they can retire to the upland meadows, where they lodge in the high grass, and among the rushes; sometimes they resort to the low coppice woods, especially if there be corn lands near them.

In the harvest-time, when the corn-fields are full of men, they are found in the fallow fields next to the corn-fields, where they lie lurking among the woods till evening, and then they get over into the corn, and feed late and early on the corn in the sheaves. When the proper haunts are known, the next thing is to find the birds in them: this is done variously; some will do it by the eye only; and this art can never be taught, but can be had only from long observation: the colour of the birds being so like that of the earth at a distance, that no eye but a very conversant one could distinguish them. When they are once seen, the business is to keep an eye upon them, and then to keep in continual motion. They are a very lazy bird, and by this means will let a person almost tread upon them; though, if the person stands still to eye them, they will rise immediately, though they are at a considerable distance.

Another method of observing them is by going to their haunts very early in the morning, or at the close of the evening, which is called jucking-time. The noise of the cock partridge is to be attended to at this time, and is very loud and earnest. The hen will soon come up to the cock after her making the noise, which she does by way of answer; and when they are got together, their chattering will discover them. Thus they may always be found at these times: but there is a yet better method of finding this bird, which is by the call. The business, in order to have success in this way, is carefully to learn the notes of the partridge, and be able to imitate all the several sounds. When perfect in this, the person is to go to the haunts morning and evening, and, placing himself in some situation where he can see the birds without being seen by them, he is to listen to their calling; and, when they are heard, he is to answer in the same notes, doubling again as they do: by continuing this, they may be brought so near, that the person, lying down on his back, may count their whole number. Having in this manner found where the birds are, the next care is to catch them.

They are so foolish, that it is extremely easy to take them in nets. In order to this, there needs no more than the going out, provided with two or three nets, with meshes somewhat smaller than those of the pheasant nets, and walking round about the covey, a net is to be fixed so as to draw over them, on pulling a line at a distance. All this may be easily done; for so long as the sportsman continues moving about, and does not fix his eyes too intently upon them, they will let him come near enough to fix the nets, without moving.

moving. If they lie so straggling, that one net will not cover them, then two or three must be fixed in the same manner. The sportsman may then draw the nets over them; and they will often lie still with the nets upon them till he comes up to fright them, then they will rise, and be entangled in the net.

A second method of taking them is with bird-line: this is done by means of wheat-straws. These must be large, and cut off between knot and knot; they must be well limed with the best and strongest bird-lime, and the sportsman must carry a great number of them out with him. Having found a field where there are partridges, he is to call; and, if they answer, he is then to tick up the limed straws in rows across two or three lands, and, going backward, call again to them, leading them on in the road where the straws are: they will follow one another like a flock of chickens, and come out to the call; and will in their way run upon the straws, and liming themselves, they will daub one another by crowding together, so that very few of them will be able to escape.

But there is yet a pleasanter way of taking them than this, that is, by driving of them: in order to this, an engine is to be made of canvas stuffed with straw, to represent a horse: this horse and nets are to be taken to the haunts of the partridges, and the nets being placed slanting or slope-wise in the lower part of the field, the sportsman is to take the wind in his back, and get above them, driving them downwards; his face is to be covered with something green or blue; and, placing the horse before him, he is to go towards them slowly and gently; and by this means they will be raised on their legs, but not on their wings, and will run before the horse into the nets. If in the way they go into a wrong path, the horse is to be moved to face them; and they will be thus turned back again, and driven every way the sportsman pleases. See GAME.

Partridges are often found very troublesome and destructive to the grain produce of the farmer. These sorts of birds principally delight to lie and bask in the corn-fields, especially while the grain is upon the land in its growing state, as it then affords them a safe and pleasant retreat, where they can remain without being in any way disturbed, and in which they can the most conveniently breed and rear their young. In this way they, however, frequently commit much injury upon the different crops, by feeding and trampling upon them, and therefore require to be destroyed. When the corn is cut, they also frequently continue in the stubble of the same fields, feeding upon the grain which has fallen out of the ears, and find in these a sufficient cover for concealing them, especially in those of the wheat kind. Afterwards, when these become thin, and much trodden down, they betake themselves to the barley and oat stubbles, or the clovers, where they collect together in large coveys, and conceal themselves. In the winter part of the year they are not so often met with in these places, but retire to the low woods and uplands, or pastures, where they lie in the bushes, and among the high coarse plants. The low copices very frequently supply a covering for them at this season, particularly where there are corn lands at no great distance, where they can get food that is suitable for them. They likewise consume the grain at the time of putting it into the earth, in which way they are also mischievous to the farmer.

PARTRIDGE, *Indian*, *Coturnix Indica*, the name given by the Spaniards to a bird of the West Indies, of which there are three or four species; all of which Nieeremberg says, are properly of the partridge kind. See TETRAO (*Coturnices*). See also COLIN, and QUAHITZONECOLIN.

PARTRIDGE, *Red-legged*, a very delicate and valuable bird, called *coturno* by the Italians.

It is distinguished from the common partridge by the redness of its beak and legs; it is of a greyish-ash colour on the back; its throat is white near the head, but has a small black spot on each side at the angle of the bill, and this white space is surrounded by a black line; its breast is of a yellowish-brown, and its wings are variegated with black, yellowish, and white. It is not found in England, but is sometimes shot in the islands of Guernsey and Jersey. See TETRAO *Rufus*.

PARTRIDGE, *White*, *Perdix Alba*, a name given by many to the lagopus, a rough-footed bird of the gallinaceous kind, common on the snowy mountains, and by some called the *rabolane*. See PTARMIGAN. See also TETRAO *Lagopus* and *Albus*.

PARTRIDGE, *Sea*, *Perdix Marina*, in *Ichthyology*, a name given by some authors to the foal-fish, from the firmness and delicacy of its flesh.

PARTRIDGE *Bay*, in *Geography*, a bay on the south coast of Labrador. N. lat. 50° 16'. W. long. 63° 20'.

PARTRIDGE *Island*, an island of the South Pacific ocean, in the vicinity of Van Diemen's land, and discovered in the voyage for search of La Perouse, May 1792, and so called by some of the crew who first observed it, from an apprehension that it abounded with partridges, which were probably mistaken for quails. This small island is upwards of 100 toises in length, and situated in S. lat. 43° 23' 30". On the shore was found the low species of parsley, called "apium prostratum," in great abundance. Many species of the "cauarina" grow here, and, among the plants, seen for the first time, was a remarkable species of the "limodorum." Numerous kinds of ferns were also collected, and a beautiful species of the "glycine," remarkable for its scarlet flower. No fresh water was found upon this island; though several forsaken huts shewed that it had been frequented by the savages. Labillardiere's Voyage in Search of La Perouse, vol. 1.

PARTRIDFIELD, a township of America, in Berkshire county, Massachusetts; 26 miles W.N.W. of Northampton; containing 1361 inhabitants.

PARTUNDA, in *Mythology*, a goddess among the Romans, who presided over women at their delivery.

PARTURITION, in *Midwifery*, the act of bringing a child into the world, from *parturio*, to be in labour. See LABOUR.

PARTUS, LABOUR, the birth of a child, from *pario*, to bring forth. It is also used to denote the fruit, or thing produced. "Feræ diligunt partus suos." Cicero. Beasts love their offspring. See LABOUR.

PARTUS *Cæsareus*, the delivery of a child through an opening made through the integuments of the abdomen, and into the uterus. See CÆSAREAN *Section*.

PARTY or PARTIE, a faction, interest, or power, considered as opposite to another.

England was, for upwards of a century, divided into two parties. See WHIG and TORY.

PARTY, in *Law*. See PARTIES and CHARTER-PARTY.

PARTY, in the *Military Sense*, is used for a small body of men, whether cavalry, infantry, or both, commanded on any expedition, such as pillaging the country of an enemy, taking prisoners, and obliging the country to make contribution.

Parties are also sent out to view the roads and ways, get intelligence, seek forage, reconnoitre, or amuse the enemy upon a march; they are also frequently sent upon the flanks of an army, or regiment, to discover the enemy, it

near,

near, and prevent surprize or ambushade. The following allowances are granted to parties escorting deserters, in consideration of the unavoidable extraordinary wear of their clothing and necessaries on that duty; *viz.*

Distances from Quarters.		For each Man.			
Between	and	miles	£.	s.	d.
8	20	—	0	1	0
20	50	—	0	2	0
50	100	—	0	4	0
100	150	—	0	5	0
150	200	—	0	6	0
above	200	—	0	7	6

In the like proportion allowances are to be made for parties of four, five, and six men, but no higher. This, however, is to be understood as a regulation of allowance merely; it not being the intention of government thereby to restrain any commanding officer from employing larger parties on the escort duty, if he should think proper, but that whatever may be the actual number of the parties, the allowances are to be in the proportion of

Three men for an escort of	from	5 to 8 deserters.
Four	—	9 — 12
Five	—	13 — 16
Six	—	17 — 20

Exact returns of the said duty, as performed by each corps, are to be made up, according to a prescribed form, as soon as possible after every 24th of June and 24th of December, for the half years immediately preceding, and are to be transmitted to the office of the secretary at war, in order that the allowance may be settled. James Mil. Dict.

PARTY, Firing, denotes those who are selected to fire over the grave of any one interred with military honours, if below the rank of brigadier-general. The specific number of which the party is to consist, depends upon the rank of the officer interred.

PARTIES, Working, consist of small detachments of men under the immediate command and superintendance of officers who are employed on fatigues, which are not purely of a military nature. They are generally called fatigue duties, being different from those of parade, or of exercise in the field. They principally consist in digging canals, repairing roads, working on fortifications, except such as may be constructed in one field, or upon actual service. An addition is made to their pay, as a reward for their labour, and a compensation for their extraordinary wear of necessaries; half of which should always be paid into the hands of the captains and commanding officers of companies, for this latter purpose. James.

PARTY Arches, in *Building*, are arches built between separate tenures, where the property is intermixed, and apartments over each other do not belong to the same estate.

PARTY Bleu, in the *Military Art*, a name formerly given to a party of robbers, who infested the roads in the Netherlands. They belonged to neither army, but robbed both sides, without any regard to parties. Hence the term has been more generally applied to a band of military robbers.

PARTY China, a name given by the English merchants, and others, to a sort of porcelain or china-ware, which is elegantly painted on the outside with some bright colour, and blotted or variegated with round or square spots of a different tinge. The manner in which the Chinese do this is a very simple and easy one, and may be imitated in our potteries with great ease.

They prepare as many pieces of paper as they intend to have spots on the vessel, and cut them exactly into the shape of those spots: they wet these, and then spread them

smoothly on the places where the spots are to be. When this is done, they cover the vessel with the brown and gold, or any other varnish, and then take off the papers; in the places which they covered no varnish has come; so that they are so many regular white spaces. These they cover with some other colour, laying it on carefully with a pencil: when this is done, they varnish over the whole vessel with the common varnish, and bake it. In some vessels they lay on only plain blue, or plain black, in the spaces destined for spots; and after the first baking, they cover these with gold, and make them so many figures of squares, triangles, or globes, pure gold.

PARTY Walls, in *Building*, are partitions of brick made between buildings in separate occupations, for preventing the spread of fire. For the regulations prescribed by an act of 14 Geo. III. see **BUILDING**, substituting for 42d 14th.

PARTY Jury, in *Law*. See **MEDIETAS Lingua**, and **JURY**.

PARTY, in *Heraldry*. See **PARTI**, **PALE**, and **FESSE**.

PARU, in *Geography*, a fort of Brasil, in the jurisdiction of Paru, on the N. side of the river Amazon. N. lat. 1° 50'. W. long. 54° 10'.

PARU, or *Ginipape*, a river of Brasil, which runs into the Amazon, near Paru.

PARU, in *Ichthyology*, the name of a very singular American fish. See **STROMATEUS Paru**, and **CHÆTODON Paru**.

PARUA, in *Geography*, a river of Brasil, which runs into the Atlantic, S. lat. 13° 20'.

PARVATI, in *Mythology*, is the consort of the Hindoo deity Siva, the personification of the destructive, or rather renovating or changing power in their triad. (See **SIVA**.) The consorts of the Hindoo male divinities are termed their Sakti, which means their energy, or active power. (See **SAKTI**.) The females are thus coequal to their spouses, and are endowed with the same attributes, and differ, in sex excepted, very little from them. (See **MATRI**.) A history of the goddesses Parvati, under her various forms and names, might be extended to volumes, and many volumes, we may say scores of volumes, have, in fact, been written thereon. The sacred romances called Puranas, abound in legends relating to the origin and proceedings, the amours, quarrels, incarnations, battles, &c. adventures of this all-producing, all-pervading personification of nature. She is said, like her lord, to have a thousand names; they are strung metrically together, and are recited by her votaries in their propitiatory adorations. Parvati means *mountain-born*, she having, in one of her many terrestrial descents, sprung from such a parentage, as is noticed under the article **MERA**. In her name and character of Parvati, many magnificent temples are erected to her honour in different parts of India, especially on mountains and elevated situations. All mountains, as bearing a conical form, a form naturally assumed by fire, are typical of this goddess or her lord; he being a personification of that *destructive*, and in its form of heat, *renovating*, element. Throughout India, from Nepal to Ceylon, and from Siam to Surat, temples are raised to this extensively worshipped couple, and their sectaries, under various names, still offer adoration in them. At Poona the principal temple is on a high hill called Parvati, or Parbutty, which gives a name to the quarter of the city in its neighbourhood. Durga is another of her names, and this name, meaning *difficult of access*, is appropriately given to hill forts, provincially corrupted into **Droog** or **Durgam**. Chitteldroog, for instance, is corrupted from Sita, and Durga, names of this goddess, which, in composition, and with a grammatical copulative, mean the hill, or inaccessible place of Sita. See **CHITTEL-DROOG**;

PARVATI.

DROOG; and, in the same page of this work, CHITTAGONG, which latter is altered from Sita-gao, or gom, the town of Sita. Much of the geographical nomenclature of India is thus derivable from its mythological personages. Another instance of the extensive scope of Hindoo mythology will be found under the article LANKA, where a splendid temple is noticed as dedicated to this goddess in her character of Kaumari or the Virgin; corresponding, in this instance, as she does likewise in many others, with the Tauric Diana. She may be identified similarly with most of the female deities of Greece and Rome, not in name merely, but in attributes and character. Most of those female deities are found, on minute inspection, to melt into one, as do those of India into Parvati; who is a personification of the moon, as her consort Siva is of the sun; coequal emblems merely of "that infinitely greater light, whence all proceeded, whither all must return, and which alone can illumine our intellects." This is the substance of the most sacred text of the Hindoo scripture. (See O'M.) Under her names of *Idita* and *Ilita* in this work, she appears in the character of *Lucina*, one of whose names was *Ilythya*. See those articles.

The attributes of Durga are conspicuous in the festival called by her name Durgotsava; and, in this character, we are told by sir W. Jones the resemblances Minerva—"not the peaceful inventress of the useful and fine arts, but Pallas, armed with a helmet and spear; both represent heroic virtue, or valour united with wisdom. Both slew demons and giants with their own hands; and both protected the wife and virtuous, who paid them due adoration." Af. Ref. vol. i.

As the mountain-born goddess, or Parvati, she has many properties of the Olympian Juno; her majestic deportment; high spirit, and general attributes are the same; and we find her on mount Kailasa. (See KAILASA.) And at the banquets of the deities uniformly the companion of her husband." Ib. In her character of Bhavani, sir W. Jones supposes the wife of Mahadeva, or Siva, to be as well the Juno Cinxia, or Lucina of the Romans (called also by them Diana Solvizona, and by the Greeks Ilythya) as Venus herself; not the Italian queen of laughter and jollity, who, with her nymphs and graces, was the beautiful child of poetical imagination, and answers to the Indian Rhemba (see RHEMBA), with her train of Apsaras, or damsels of Paradise; but Venus Urania, so luxuriantly painted by Lucretius, and so properly invoked by him at the opening of a poem on nature. "Venus presiding over generation, and on that account exhibited sometimes of both sexes, (an union very common in the Indian sculptures,) as in her bearded statue at Rome; and perhaps, in the images called Herma-thena, and in those figures of her which had a conical form; for the reason of which we are left (says Tacitus) in the dark. The reason," continues our author, "appears too clearly in the temples and paintings of Hindoostan, where it never seems to have entered the heads of the legislators or people, that any thing natural could be offensively obscene; a singularity which pervades all their writings and conversation, but is no proof of depravity in their morals." Ib.

This highly gifted author, in his dissertation on the Gods of Greece, Italy, and India, identifies the Stygian, or the Tauric Diana, otherwise named Hecate, and often confounded with Proserpine, with Kali, a name and form of Parvati, in her character of wife of Kal, who corresponds with the Stygian Jove. Human victims, as well as the sacrifice of horses and bulls, enjoined by the Veda, being in the present age absolutely prohibited, kids are now offered to Kali, or the black goddess; and to palliate the cruelty

of the slaughter, which gave great offence to the Hindoo followers of milder tenets and practice, the Brahmans inculcate a belief, that the poor victims rise in the heaven of Indra (see INDRA), and become the musicians of his band. Under the article KALI of this work, a minute description is given of Hindoo images of this black goddess. A cap, called by both Romans and Hindoos *patera* (see PATRA), a whip, or cord (see PASH), a sceptre, a child, a car drawn by peacocks, and by lions, a turreted crown, a drum (called *dyndima* both in Greek and Sanscrit), a sphere, a torch, a lily or lotos, a serpent, a spear, a bow, with other common attributes, might be noticed as identifying the multiform, myrionimous goddesses in question. A consideration of what is given in this work under the articles ASTARTE, CYBELE, DIANA, JUNO, PROSERPINE, VENUS, and other names of the same goddess, compared with that under this, and the various articles hence referred to, is more than sufficient to convince us of their identity.

That the names just noted, as well as Urania, Isis, and many others, are in fact of the same goddess Nature, under different forms, there can be no doubt. The Pantamorphia Mater; Dea Jana, or Diva Jana, was easily made by the Romans into Diana. Devi-jenni, the teeming goddess; Vifwa-jenni, the all-producing, are Sanscrit terms, applicable to Parvati in her character of Prakriti or Nature. Juno may be derived from Yoni; Ceres from Sri, or in one case Sris; Anna Perenna, from Ana-purna, a name of Parvati, meaning, in Sanscrit, abundance of food, or one who fills with food. In this character she holds a ladle. Astarte, as well as Esther, Astartoth, and the Persian Sitara, meaning a star, or something sidereal, may be traced to Astarta, another name of the Hindoo goddess, derived from a legend in which she was seated among eight points, and hence applied to the radii of a star. The learned antiquary Spon (Misc. Erud. Ant.) gives a print of a monument where Diana is called Clatra; her attributes are those of Parvati, one of whose names is Kalratri, the goddess of darkness, the origin possibly of its unmeaning synonyme. Under the articles LINGA and SIVA, is shewn that the first in the shape of a cone, mostly a black conical stone, is the phallic emblem of the latter, and of course of his consort Parvati. Western mythologists tell us of a black conical stone that fell from heaven; it was placed in a temple of Astarte, or the moon, and itself adored as a type of the sun. See ASTARTE.

The Paphian goddess was also anciently symbolized by a cone. When Dr. Clarke, in his recently published "Travels," describes some antiquities of the holy land, we might almost imagine that he was in the country of the Hindoos. He describes "a subterraneous conical temple, having no resemblance to any Christian temple, its situation under the pinnacle of a mountain, one probably of the three points of the Mount of Olives, (see MERU,) the highest of which was set apart for the worship of Astartoth," &c. (vol. ii. p. 578.) denoting strongly the Hindoo superstition having been anciently prevalent there. The pyramids of Egypt, Stonehenge in England, and many other antiquities now remote from its scenes, are referred, and with plausible arguments, to the same polytheistic source.

It is curious to see in Dr. Clarke's plate delineating "the sacred pictures in use among the Calmuck tribes," exact representations of Hindoo deities. In the figure that he properly styles "Diva Triformis, Luna, Diana, and Hecate," we recognize, unequivocally, the Hindoo Parvati, in one of those many forms in which she is generally termed Devi, or the goddess. Devi Tri Sakti, or with three forms, or powers, is one of her names. In Dr. Clarke's plate, she has

PARVATI.

has her own mystical hieroglyphic, a type of the Yoni, on the forehead; collars, of skulls perhaps, round and pendent on her neck and belly; a glory, or nimbus round her head; six-handed, holding a bow and arrow, the trisula or trident of Siva (see TRISULA), a cone or linga, the chakra, or discus of Vishnu, his club, and lotos (see VISHNU), and the cord, or pasha of Devi, before referred to; and the Kalmuck divinity fits in one of Devi's commonest positions on a lotos throne. Such a subject we should have expected to find in the Hindoo Pantheon, rather than in Russian travels. A representation is likewise given of "Osiris or Bacchus of the Calmucks." This is also a Hindoo subject, but being only two-handed there is not much scope for attributes; it has the distinguishing forehead-mark, attitude, countenance, and character of the Hindoo school. The next, "Hyperion or Phœbus of the Calmucks," is a barbarous representation of Krithna, with the serpent Kaliya, and other Hindoo attributes. (See KALIYA.) The "Terpsichore of the Calmucks playing on the Balalaikas," is Sarafwati with her Vina. Dr. Clarke does not say where he obtained these subjects, nor in what degree they are honoured; but we see no reason to doubt their genuineness. They have found their way into Asiatic Tartary, through China probably; and would lead us to infer that the Kalmucks have, or have had, some Hindoo superstitions among them. Their name is easily traceable to the same source. Kal-mu-ki is pure Sanscrit, and means black-faced, or with the countenance of Kal; a name that is applicable to Parvati in some of her characters; although we do not recollect any specific authority for giving her that appellation.

But it would be tiresome and almost endless to follow this female Proteus through her varied changes, and the many legends detailing them in the Puranas. We will proceed to offer a list of some of her names; and for beauty's sake, such of them as have furnished articles for this work are put in capitals, to which articles the reader desirous of farther information is thus generally referred. Amba (see UMA). Annapurna. Annada. Anjanabha. Anumati. Antargati: under this name she is invoked as a martial goddess, for strength of heart and courage. Aparajita: this has been thought the same word as the Greek Aphrodite (see MATRI). Aranya-Devi, or the goddess of the forest. Ardha Nari, or half woman: in this character she is represented conjoined to her spouse; one side being Siva with his attributes, the other side her own. The celebrated one-breasted gigantic figure in the cavern temple at Elephanta, is of this subject. Ashtara. Asita. Asvini, meaning a mare; in this form the sun approached her as a horse, and on their nostrils touching she conceived twins, who are called Asvini-Kumari, represented like Castor and Pollux, and each has the character of Esculapius among the gods. It will be recollected, that he is fabled to have descended from a nymph, who in the form of a mare was impregnated with sun-beams. His name is traceable to the Sanscrit, in which language Asva-Kalupa means mare-descended. Bhadra. Kali (see KALI). Bhagi, as the consort of Bhaga, a name of Siva, and of the sun. Bhavani, as consort of Bhava, a name of Siva, the author of existence. Bhavani is the general power of fecundity. Venus generatrix. Bhudevi, goddess of the earth. (See PATALA-DEVI.) Kawfiki, or Kawfiki. Chamunda. Chandika: Charchika. Devi, the goddess, the queen, pre-eminently so called by her sectaries, and by others. This title is, however, sometimes given to other female divinities. Devi-jenni, the prolific goddess, or the mother of gods. Durga, or difficult of access, as noticed in an earlier part of this article. Feringahi. Ganga,

VOL. XXVI.

the river Ganges: in this character she sprung from the head of Siva, and bore a son to him, named *Kartikya*, which see, and MENA and MERA. Gauri, meaning fair or young. When seen together, in pictures or statues, or conjoined as noticed before of Ardha Nari, the goddess and her spouse are frequently called Har-gauri; Hara being a name of Siva, and Hari of his consort. IDITA. ILITA. ISI. ISANI. ISWARI (see ISWARA). IVA, or of one letter, derived from I, and pronounced as a disyllable exactly like Eve. Kalratri. Kirti. KAUMARI. KALI. KATTAYANI. Kawfiki. Lilefwari (see LILESWARA.) MA. MAHAKALI. MAHAMARI. Mahamayi. MAHESWARI. MAL-SARA. Manafa. MEKARA. NILA. PALLYANGHI. PARA. PARAMESWARI. PATALADEVI. PEDMADEVI. PIKESWARI. PRABHA. PRAKRITI. RAJARAJESWARI. RAMI. RAUDRI. RUDRI. RUDRANI. SAMI. SAMIDEVI. SAMIRAMI. SARASWATI. SARVAJAYA. SARVAMANGALA. SATORUPA. SATI. SATWI. SATWIKI. SHASHTI. SHYANULA. SRI. SUDURGA. SUKALI. SWARDEVI. SWETADEVI. SYAMA. TAMASI. TRIKALADEVI. TRISAKTIDEVI. TRIVIDHA. UMA. VAGESWARI. VAJRESWARI. VISWAJENNI. VYAGRAYAHI. YONI.

In her character of Parvati, she is usually seen in pictures in company with her spouse, and is represented as of perfect beauty, splendidly dressed and decorated; sometimes sitting on his knee, or on a carpet beside him, or on a tiger's or elephant's skin, presenting him amrita (ambrosia) in a golden goblet. Sometimes she is mounted with him on a white bull (see NANDI), with their reputed sons *Kartikya* and *Pollux*; see those articles.

Under her various forms and characters she is variously armed and arrayed; see, for instances, under KALI and MATRI. Sometimes she has four, eight, twelve, sixteen, and as far as thirty-two arms. In the plates of the Hindoo Pantheon, she is represented upwards of fourscore times, in varied form and character; and legends are said to be found in the theological and mythological writings of the Hindoos, detailing her origin and achievements in each. In some plates of the work just alluded to, she is represented, from original subjects, pre-eminently placed as the supreme object of adoration; the chief of the gods, even the three persons of the Hindoo triad, being among her votaries. See of the Hindoo triad, under TRIMURTI. Such pictures and sculptures may be ascribed to the sects who adore her exclusively as Nature. Such sects are called *Lingi-Lingaja*, and *Sakta*. See those articles, and LINGA.

Like their copies, the Jupiter and Juno of the Greeks, the Hindoo Mahadeva and Parvati, have, in the Puranic legends, many quarrels and reconciliations. These are, in fact, the phenomena of nature, hidden from the vulgar eye in a veil of allegory, and in such a veil sometimes, as not to be altogether decent to the taste of people less gross than the Greeks and Hindoos. The language of Parvati is occasionally as free as Juno's in the page of Homer. In illustration of this allegorical style, the following verse may be aptly introduced from sir W. Jones' spirited hymn to Ganga, a personification of the river Ganges. It exhibits the popular notion of a solar eclipse, for Siva's frontal or central is, like himself, the sun, obscured by the intervention of the hand of Parvati, or the moon. We see too, (for the ideas of the hymn accord strictly with the legends of Hindoostan,) the means confidently resorted to by a priest-ridden people for restoring the equilibrium of nature's elements; and that Ganga springs, like Pallas, from the forehead of the Indian Jove.

" Above the stretch of mortal ken,
On blest Kailasa's top, where every stem

Glow'd with a vegetable gem,
 Mahefa fate, the dread and joy of men ;
 While Parvati, to gain a boon,
 Fixed on his locks a beamy moon,
 And hid his frontal eye, in jocund play,
 With reluctant sweet delay.
 All nature straight was lock'd in dim eclipse,
 Till Brahmans pure, with hallowed lips
 And warbled prayers restored the day ;
 When Ganga from his brow, by heavenly fingers prest,
 Sprang radiant, and descending, graced the caverns of the
 [west.]

Parvati and Saraswati are sometimes seen to correspond in character. It may, perhaps, be thus accounted for ; Siva is the *changing*, or *renovating*, rather than the *destroying* power ; he re-produces : for destruction, say the philosophers, is but reproduction in another form. This is so similar to making or creating, the province of Brahma, that the terms and powers almost coalesce. Brahma, indeed, is merely a periodical reorganizer of chaotic matter. (See KALPA.) Parvati and Saraswati are the energies of the personification of those changing powers, and we may hence discern why their characters and attributes are sometimes made to accord. The consort of Brahma is occasionally, though but rarely called Prakriti, and the helpmate of Siva, Satarupa ; here changing names and characters, as it were. Bhavani is also occasionally invoked as the goddess of speech, or eloquence, a character more especially of *Saraswati*. (See that article.) In like manner this pantomorphic goddess is found now and then to correspond in name and attributes with Lakshmi. She is occasionally seen with the chank or shell of the latter power : and with the lotos, more especially her emblem, and hence Padma-devi is a name common to both, meaning the goddess of the lotos, that plant being the emblem of female beauty, and being aquatic, also of humidity ; and both these goddesses assume the character of the Venus of the Greeks. (See LAKSHMI and RHEMBA.) Sri, or the blessed or fortunate, is likewise a name given to them both.

The sectaries of this goddess, who under different names, and adoring her under different forms, are numerous, have various symbolical marks by which they are distinguished. Generally speaking, horizontal lines on the forehead distinguish the *Saivas* from the *Vaishnavas*, (see those articles,) the latter having them perpendicular. On the subject of such sectarial marks and distinctions, a plate exhibiting a great many, with copious remarks, is given in the Hindoo Pantheon, to which we refer those desirous of farther information hereon.

It has been noticed that to this goddess, in her character of Kali, it was that human victims were formerly offered. The rites and ceremonies to be observed on these horrid occasions, are minutely laid down in the Kalika Purana, extracts from which are given under the article NARAMEDAI of this work. See also KALI and PURANA.

PARVETI MOUNTAINS, in *Ancient Geography*, a chain of mountains described by Ptolemy, corresponding to the heights of Suhmandroog, lying S.E. of Candahar, and being the southern boundary of the province of Paro-pamisus.

PARVICH, in *Geography*, a small island in the Adriatic, near the coast of Dalmatia, fertile in grapes, olives, and mulberries.

PARVISE. See PERVERSE.

PARULIS, from *παρῦς*, and *σλοῖς*, the gums, in *Surgery*, an inflammation, or abscess of the gums ; a gumboil. See GUMS, *Diseases of*.

PARUR, in *Geography*, a town of Hindoostan, in Cochinchina ; 10 miles E.S.E. of Cranganore.

PARUS, the Titmouse, in *Ornithology*, a genus of birds of the order Passeres. The generic character is ; bill very entire, narrow, subcompressed, strong, hard, pointed and covered at the base with bristles ; the tongue is truncate, bristly at the end ; the toes are divided to the origin, the hind one large and strong. These birds are found in almost every part of the old continent, from the north of Europe to the south of India. They are highly prolific, laying eighteen or twenty eggs, which they hatch with unwearied patience. They build their nest with particular neatness and skill, and frequently on the extremity of some branch suspended over water, by which they secure it from the attack of various animals, to which it might otherwise fall a prey. They are wonderfully active and alert, rapid and assiduous in their search for insects, on which they principally subsist, under the bark, and in the crevices of trees, which they clear of the immense multitudes of caterpillars covering them in spring, and which would totally blast their vegetation. They are not migratory, though they occasionally change their residence for short distances. They are irritable and irascible to a great degree, and when angry, will display the ardent eye and ruffled plumage, which indicate the paroxysm of agitation. They possess a very extraordinary degree of courage, and will sometimes attack birds three times their size. The owl is not secure from their rage ; and whatever bird they pursue, their first attempts are levelled at the head, and particularly at the eyes and brains, the latter of which they devour with particular avidity and relish. According to Gmelin, there are thirty-one species, though Latham describes twenty-seven only.

BICOLOR ; Toupet Titmouse. Head crested, on the forehead black ; body emereous ; beneath whitish rufous. It inhabits the woods of North America, and is six inches long. The bill is black ; crest pointed, grey ; orbits pale rufous ; quill and tail-feathers edged with grey rufous ; the tail is slightly forked, the legs are of a lead colour. The female has a white belly.

CRISTATUS ; Crested Titmouse. Head is crested ; collar black ; belly white. Inhabits Europe, chiefly in fir-woods ; is five inches long, solitary, and not easily tamed.

* MAJOR ; Great Titmouse. Head black ; temples white, nape yellow. The bill, chin, and tail are black ; the back and wings are olive ; rump blue-grey ; belly greenish-yellow, divided in the middle by a band of black, extending to the vent ; the quill-feathers are of a dusky colour, edged partly with blue, and partly with white ; exterior sides of the outmost tail-feathers white, of the others blueish ; inner sides dusky, legs lead-coloured. This species weighs little more than an ounce, and is almost six inches in length. It is found in Europe, Asia, and Africa, and is very common in this country, frequenting gardens and orchards, where it does a deal of mischief, by picking off the tender buds of trees. The nest is made of moss, lined with hair, and placed in the hole of a wall, or of a tree. The female lays six or eight or ten eggs, which are white, spotted with a rusty kind of colour, and so exactly like those of a nut-hatch, as not to be distinguished from them. The common note of the great titmouse is a sort of chatter, but in the spring it assumes a greater variety, a shrill whistle, and a very singular noise, something like the whetting of a saw, but these cease with incubation. There is a variety of this species, called the cross-billed titmouse, which is olive-brown, beneath dirty-yellowish ; the head is black, the temples emereous ; the bill forked. This bird was killed once near Feversham in Kent ; it had its bill crossed, as in the *Loxia curvirostra*.

IGNOTUS ;

PARUS.

IGNOTUS; Stræmian Titmouse. Yellow-green; breast yellow, spotted with rufous; belly blue; vent yellowish. It inhabits Norway, and very much resembles the Major.

CYANUS; Azure Titmouse. Pale blue, beneath snowy; rump and crown whitish-hoary; neck above white, with a broad blue band; shoulders and tail-coverts blue. It is found in divers parts of Russia and Siberia, and is about five inches long.

AMERICANUS; Creeping Titmouse. Blueish; temples, breast, and back yellowish; flanks of a purple colour. It inhabits Carolina and Canada, is nearly five inches long; continually runs up and down trees in search after insects.

* **CHRULEUS**; Blue Titmouse. Quill-feathers blueish, the primaries white on the outer edge; front white; crown blue. The bill is blackish; line from the bill to the eyes, and one surrounding the temples, black; the back is of a yellowish-green; wing-coverts blue; quill-feathers black, with dusky edge; tail blue, the middle feathers longer, body whitish-yellow beneath; legs and claws black. It is about four inches and half long, and weighs less than half an ounce. This species would, probably, be much admired for its beauty, if it were less common. In winter it frequents houses, and will devour flesh very greedily. It is also a constant attendant where horse-flesh is kept for hounds, and in the farm-yard, being very fond of oats, which it plucks out, and retiring to a neighbouring bush, fixes the grain between its claws, and hammers it with the bill, to break the husk. In summer it feeds chiefly on insects, in search of which it plucks off a number of young buds from the trees. The nest is made very like that of the Major, and the female is so tenacious of her nest, that she will often suffer herself to be taken rather than quit it. She menaces every intruder in a singular manner, hissing like a snake, erecting all its feathers, and uttering a noise like the spitting of a cat, biting, at the same time, severely, if handled.

ATRICAPILLUS; Canada Titmouse. Cap and chin black; body cinereous, beneath it is white. It inhabits North America, is four inches and a half long; feeds on worms and insects, and is very patient of cold.

ATER; Colemouse. Head black, back cinereous; hind head and breast white; the bill and chin are black; a broad black stripe beneath the eyes, from the bill to the neck; belly and vent reddish-white; wing-coverts grey, tipped with white; quill and tail-feathers brownish ash, edged with grey; legs and claws lead-coloured. It does not weigh much more than a quarter of an ounce, and is four inches in length. It has frequently been confounded with the next, the *Palustris*, but is not so common; it keeps more to the woods, seems to live entirely on insects, and has also a different note.

* **PALUSTRIS**; Marsh Titmouse. Head black; back cinereous; temples white. There are three varieties. 1. Wings without the white bands. 2. Body beneath and band on the hind-head white. 3. Crown black; nape yellowish. This species inhabits different parts of Europe: it is fond of flesh and also of oats, like the blue titmouse. It is partial to low wet ground, in the holes of which it frequently nestles.

VIRGINIANUS; Virginian Titmouse. Rump yellow; body cinereous. It inhabits Virginia and Carolina, and is five inches long. The bill is blackish, body above olive brown, beneath grey; legs and claws brown.

PEREGRINUS; Crimfon-rumped Titmouse. Rump scarlet; body cinereous, beneath white. It is of the size of the *P. major*. The quill-feathers are brown; tail-feathers black, except the four middle ones, which are obliquely yellow on the hind part.

GRISEUS; Crimfon-crowned Titmouse. This is of a grey colour; the crown is red. It inhabits Greenland.

AFER; Black-breasted Titmouse. Blackish; cheeks, nape, and belly white; neck beneath, and breast black. It is found at the Cape of Good Hope, and is six inches long.

CAUDATUS; Long-tailed Titmouse. Crown white; tail longer than the body; it weighs about a quarter of an ounce, and measures five inches and a quarter in length. This is a very elegant and singular species, and is chiefly confined to the woods and thickets of Europe and Siberia, where it makes a curious oval nest of lichens, firmly woven together with wool, and having only a small hole on the side, placed in the fork of some bush, or branch of a tree. The female lays from nine to seventeen eggs, which are white, and sparingly marked with small rust-coloured spots towards the larger end.

CAPENSIS; Cape Titmouse. Grey-ash; quill-feathers black, edged with white; tail above black, beneath white. The bill and legs are black. It inhabits the Cape of Good Hope. It constructs a luxurious nest of the down of a species of *asclepias*; near the upper end projects a small tube, about an inch in length, with an orifice about three-fourths of an inch in diameter. Immediately under the tube is a small hole in the side, that has no communication with the interior of the nest. In this hole the male sits at night, and thus both male and female are screened from the weather.

BIARMICUS; Bearded Titmouse. Rufous; crown hoary; tail longer than the body; head bearded; vent black. It inhabits the marshy places in many parts of Europe, is about six inches long, suspends its nest between three reeds; the eggs are reddish-white, with small red spots.

SINENSIS; Chinese Titmouse. Rusty-brown; head and neck paler; quill-feathers and long tail brown, edged with black. It inhabits China; is not quite four inches long. The bill is black; the legs are red.

MALABARICUS; Malabar Titmouse. Grey; chin, wings, and middle tail-feathers black; body beneath, rump, spot on the wings, and base of the lateral tail-feathers, tawny. It inhabits Malabar, is nearly six inches long. The bill is black; the irids red. The under part of the female is rufous yellow.

ALPINUS; Alpine Titmouse. Black, beneath pale rufous, spotted with black; from the base of the bill to the neck there is a white line; hind-claw very long. It inhabits the alpine parts of Persia, and is about the size of the *P. caudatus*.

SIBIRICUS; Siberian Titmouse. Grey-brown, beneath whitish; belly rufous-grey; lower part of the neck black in the middle; sides pale rufous. A variety of this species has the belly and vent white. It is found in Siberia, and is about five inches long.

KNJASCIK. White; beneath, ocular line, and collar livid. It is found among the oak forests of Siberia.

HUDSONIUS; Hudson's Bay Titmouse. Reddish-brown; back cinereous; throat black; band under the eyes and breast white; the sides are rufous. It inhabits Hudson's Bay, and is about five inches and a half long.

MACROCEPHALUS; Great-headed Titmouse. Black; breast orange; belly yellowish; head tumid; spot on the front and wings, and two outmost tail-feathers, white. A variety of this species has the breast scarlet. It is found in New Zealand, and is about four inches and a half long.

NOVA ZEELANDIÆ; New Zealand Titmouse. Red-ash, beneath

beneath rufous-grey; eye-brows white; two middle tail-feathers black; the lateral ones in the middle with a square black spot. It inhabits New Zealand, and is five inches long. The bill is brown, tipped with black; legs dusky-black.

PENDULINUS; Penduline Titmouse. Head ferruginous; ocular band black; quill and tail-feathers brown, and edged on each side ferruginous. It is about four inches and a half long. It inhabits Europe and Siberia, frequenting watering-places for the sake of aquatic insects, on which it feeds. These birds display great art in the construction of their nests. They employ the light down found on the buds of the willows, the poplar, on thistles, and the dandelion. With their bill they entwine this filamentous substance, and form a thick close web, almost like cloth. This they fortify externally with fibres and small roots, which penetrate into the texture, and, in some measure, compose the basis of the nest. They line the inside with the same down, but not woven, that their young may lie soft; they shut it above to confine the warmth, and they suspend it with hemp, nettles, &c. from the cleft of a small pliant branch over some stream, that it may rock more gently, assisted by the spring of the branch. In this situation, the brood are well supplied with insects, which constitute their chief food, and, at the same time, they are protected from their enemies. The nest sometimes resembles a bag, and sometimes a short purse. The aperture is made in the side, and is almost always turned towards the water. It is nearly round, and only an inch and a half in diameter, and is frequently surrounded by a brim. These nests are found in the fens of Bologna, Tuscany, Lithuania, Poland, and Germany. The peasants regard them with superstitious veneration, one of them being usually suspended near the door of each cottage, as a charm against lightning.

NARBONENSIS; Languedoc Titmouse. Rufous-grey; crown hoary; wings and tail blackish, edged with rufous, primary quill-feathers edged with white; four inches long. It inhabits France, and builds a strong pendulous nest on the forked branch of a tree. The bill is black; the upper mandible edged with yellow-brown; the legs are of a lead colour.

CELA; Guiana Titmouse. Black; bill white; spot on the wings and base of the tail yellow. It inhabits Guiana.

AMATORIUS; Amorous Titmouse. Blackish-blue; longitudinal spot on the middle of the wings half yellow, and rufous; five inches and a half long. It inhabits Northern Asia, and is remarkable for the mutual affection of the two sexes. The bill is black at the base, and tipped with orange.

COCCINEUS; Scarlet Titmouse. Cinereous; breast, spot on the wings, rump, and lateral tail-feathers on the hind part, scarlet. The bill and legs black, the vent is yellowish.

INDICUS; Indian Titmouse. Above cinereous, beneath ferruginous; chin and throat of a dirty white; the limbs are a black-brown. It inhabits India.

PARUSHA, in *Mythology*, is a name applied by the Hindoos to several of their deities. The word seems to mean the primeval person or man; and in some fables it is related that he was produced by the Creator at the formation of the world, with Prakriti, a personification of Nature. (See **PRAKRITI**.) The allegorical union of these two powers, male and female, have furnished endless fancies for Hindoo metaphysicians, who, among such fancies, describe an allegorical immolation of this primeval being; sometimes making Parusha, or Purusha, the victim; sometimes

Brahma, or Narayana. In the Veda, called Yajur, or Yajush, the necessary ceremonies for the sacrifices called Aśwamedha and Purushamedha, are laid down; "but they are not," as the words imply, "really sacrifices of horses and men." In the first mentioned, six hundred and nine animals of various kinds, domestic and wild, including birds, fish, and reptiles, are made fast; the tame ones to twenty-one posts, and the wild ones in the intervals between them; and after certain prayers, the victims are let loose without injury. In the other a hundred and eighty-five men of various specified tribes, characters, and professions, are bound to eleven posts, and after a certain hymn concerning the allegorical immolation of Narayana has been recited, these human victims are liberated unhurt; and oblations of butter are made on the sacrificial fire. This mode of performing the Aśwamedha and Purushamedha as emblematical ceremonies, not as real sacrifices, is taught in this Veda; and the interpretation is fully confirmed by several rituals, and by commentators; one of whom assigns as a reason, "because the flesh of victims, which have been actually sacrificed, must be eaten by the persons who offer the sacrifice: but a man cannot be allowed, much less required, to eat human flesh." This passage is cited by Mr. Colebrooke from memory: he adds, "It may be hence inferred, or conjectured at least, that human sacrifices were not authorized by the Veda itself; but were either then abrogated, and an emblematical ceremony substituted in its place, as they must have been introduced in later times on the authority of certain Puranas and Tantras, fabricated by persons, who in this, as in other matters, established many unjustifiable practices on the foundation of emblems and allegories which they misunderstood." (As. Ref. vol. viii.) A human sacrifice is called *Naramedha*, and, as described under that article, was formerly a usage among the Hindoos. For the signification of the words *Narayana*, *Purana*, *Tantra*, and *Veda*, that occur above, the inquirer is referred to those articles.

PARUSHA-Medha, among Hindoos, is an allegorical sacrifice of a man, as noticed under the preceding article.

PARUTA, **PAOLO**, in *Biography*, a noble Venetian, was born in 1540. He succeeded Contarini as historiographer of the republic in 1579, and afterwards filled various offices in the state. He was employed in several embassies, was made governor of Brescia, and finally was elected a procurator of St. Mark. With a high character for wisdom, integrity, and zeal for the public welfare, he died in 1598, at the age of 58. The following is an enumeration of his principal works, "A funeral Oration to the Praise of those who fell in the Battle of Curzolari in 1571;" "Della Perfezione della vita Politica;" "Discorsi Politici," published by his sons in 1599; "A History of Venice, from 1513 to 1551, with the Addition of an Account of the War of Cyprus;" this work is written in Italian, and is accounted one of the best works of that class in the language. He had begun to write it in Latin, in imitation of the style of Sallust, and had finished four books in that language. A new edition of this history was given by Apostolo Zeno in 1703.

PARUTA, **FILIPPO**, a learned antiquarian, was a noble of Palermo, and secretary to the senate of that city, where he died in 1629. He was author of several works, but is principally known by his "Sicilia descritta con Medaglie," published at Palermo in 1612. This work was afterwards enlarged by Leonardo Agostini, and printed at Rome in 1649, and at Lyons in 1697. Havercamp published a Latin edition of it in three volumes folio, 1723, which

which makes part of the Italian antiquities of Grævius and Burmann.

PARVUM CAPE. See CAPE.

PARWAN, in *Geography*, a town of Candahar; 60 miles N.W. of Cabul.

PARWIDA, a town of Sweden, in Tavastland; 45 miles N.N.E. of Jamsö.

PARWIS, a town of the Tyrol; 18 miles W.N.W. of Inspruck.

PAR-YARD, in *Agriculture*, a term provincially applied to the straw, or fold-yard.

PARYPATE, in the *Ancient Music*, was the name of that note or chord of a tetrachord which lay next to the hypate.

As the hypate was the *principalis*, the first, or principal found, according to Martianus Capello's translation; so the parypate was, according to him, the *sub-principalis*. See TETRACHORD.

The name parypate was given to this second note when a tetrachord was considered separately from others; but, when combined, this chord sometimes took the name *trite*. See DIAGRAM, and TRITE.

PARYPATE *Hypaton*, in the *Ancient Greek Scale of Music*, was the second note of the hypaton tetrachord, and answers to the *C-fa-ut* of Guido's scale. See DIAGRAM, and PARYPATE.

PARYPATE *Meson*, in the *Greek Music*, was the second note of the meson tetrachord, and answers to the *F-fa-ut* of the Guidonian scale. See DIAGRAM.

PARYS, in *Geography*, a mountain of North Wales, in the island of Anglesea, about nine miles in length, and half as much in breadth; apparently waste and barren in the extreme, but abounding in the richest mines of copper and lead ore, with a mixture of silver in the latter: the bed of copper ore is supposed to be the largest that is known on the globe; 2 miles S.E. of Amlwch.

PARZANEGA, a town of Italy, in the department of the Serio; 15 miles E.N.E. of Bergamo.

PAS, MANESSES DE, *Marquis de Feuquieres*, in *Biography*, was the posthumous son of Francis de Pas, who was slain at the battle of Ivry. He was born at Saumur in 1590, and distinguished himself as an able general and negotiator. At the siege of Rochelle he was taken prisoner, was continued in confinement nine months, and was ransomed in exchange for general Ekenfort, two colonels, and 18,000 crowns. The reduction of the city of Rochelle has been attributed chiefly to him. He was afterwards ambassador to the court of Sweden and Germany, where he displayed great talents. In 1635 he commanded the army in conjunction with the duke of Saxe-Weimar. He died in 1640. His negotiations in Germany were printed in 1753, in 3 vols. 12mo. Moreri.

PAS, ANTHONY DE, *Marquis de Feuquieres*, grandson of the above, was one of the greatest generals of his time. He signalized himself at the battle of Stafarde, at the taking of Suza, and other strong places in Italy, but he was so severe a disciplinarian, that it was a common saying, that De Pas must be the bravest man in the world, since he slept every night in the midst of a hundred thousand enemies. He was governor of Verdun, and in 1689 he was made, on account of his great talents, a field-marshal. He died in January 1711, aged 63. His memoirs were printed in 4 vols. 12mo. Moreri.

PAS, in *Geography*, a town of Prussia, in Bartenland; 10 miles N.E. of Raftenburg.

PAS, a town of France, in the department of the Straits of Calais; 13 miles S.W. of Arras.

PAS de Calais. See STRAITS of Calais.

PAS de Souris, in the *Military Art*, the same with *liziere*.

PASA, or FESA, in *Geography*, a town of Persia, in the province of Farfistan; 68 miles S.E. of Schiras. N. lat. 29° 10'. E. long. 53° 40'.

PASAGINIANS, or CIRCUMCISED, in *Ecclesiastical History*, a singular sect, which sprung up in Lombardy towards the close of the 12th century. Like several other sects that subsisted about the same time, this sect had the utmost aversion to the dominion and discipline of the church of Rome; but it was distinguished, at the same time, by two religious tenets that were peculiar to itself. The first was a notion, that the observance of the law of Moses, in every thing except the offering of sacrifices, was obligatory upon Christians; in consequence of which, its followers were circumcised, abstained from those meats, the use of which was prohibited under the Mosaic economy, and celebrated the Jewish Sabbath. The second point that distinguished this sect was advanced in opposition to the doctrine of three persons in the divine nature; for the Pasaginians maintained that Christ was no more than the "first and purest creature of God." Nor will their adoption of this opinion seem very surprising, if we consider the prodigious number of Arians that were scattered throughout Italy long before that period. Mosheim.

PASAKA, or BUXADEWAR, in *Geography*, a town of Bootan; 60 miles S.S.E. of Tassafudon. N. lat. 26° 48'. E. long. 89° 30'.

PASAKAMENITZ, a town of Bohemia, in the circle of Chrudim; 8 miles W.N.W. of Politzka.

PASAL, a town of Africa, in the kingdom of Fonia. N. lat. 12° 40'. W. long. 15° 36'.

PASAN, *Antelope Oryx*, in *Zoology*, a species of antelope, with straight, slender, distinctly annulated horns, which taper to a point; the body and sides are of a reddish ash colour, having a raised dusky line along the back, the hairs of which at the posterior end are reversed. This is the *Gazella Indica*, or Indian antelope of Ray; the *capra gazella*, or goat antelope of Syst. Nat. ed. 12.; the *oryx* of Pliny, and other ancient writers; the Egyptian antelope of Pennant; and the *pasan* of Buffon. It inhabits Syria, Arabia, Persia, India, Egypt, Ethiopia, and near the Cape of Good Hope. It is about the size of a fallow deer; the horns are near three feet long, the points sharp, and about 14 inches asunder; the face is white, with a black spot at the base of the horns, another on the middle of the face, and one on each side reaching from the eye to the throat, joining that on the face by a transverse band of the same colour; the belly, rump, and legs are white; the white colour of the belly is divided, on the sides, from the reddish ash-coloured upper parts, by a broad longitudinal dusky band, which reaches to the breast; each leg is marked with a dusky spot below the knee; the tail is near two feet and a half long, and is covered with longish black hairs. This species is named *gems bock*, or *chamois*, at the Cape, and is supposed by Gmelin to be the *zibi* of the sacred writers.

PASANGA, in *Geography*, a small island in the East Indian sea, near the coast of Sumatra. S. lat. 5° 10'.

PASAR, a town of Hindoostan, in the Carnatic; 21 miles W. of Tiagar.

PASARGADA, or PASARGADÆ, in *Ancient Geography*, a town of Asia, in the Perside. The name signifies the camp of the Persians, and the town had been founded in the place where Cyrus had vanquished Astyages or Cyaxares in a pitched battle. According to Plutarch, there was in

this

this town a temple of the goddess of war, who was supposed to have been Pallas.

PASARNA, a town of Asia, in Lesser Armenia, at some distance from the Euphrates, in the Lavinian prefecture. Ptolemy.

PASCAGOULA, in *Geography*, a river of America, in the Mississippi territory, which, after pursuing a S. by E. course through West Florida, and part of Louisiana, discharges itself into the gulf of Mexico by several mouths, occupying a space of three or four miles, which is a continued bed of oyster-shells, with very shoal water. This river is said to be navigable more than 150 miles. The adjacent soil improves as you advance towards its source. The bay formed by it lies in N. lat. $30^{\circ} 23'$. W. long. $88^{\circ} 30'$.

PASCAL, BLAISE, in *Biography*, a celebrated mathematician and philosopher of the 17th century, was born at Clermont, in Auvergne, in the year 1623. His father was a man of great consideration in his province, was president of the court of aids, and was illustrious as a general scholar, as well as an able mathematician. To promote the studies of his only son Blaise, he relinquished his official situation, settled at Paris, and undertook the employment of being his tutor. The pupil was, from a very early period, remarkably inquisitive, and desirous of knowing the principles of things; and when good reasons were not given to him, he would search for better, nor would he rest contented with any that did not appear to his mind well founded. His father soon discovered that the bent of his genius was decidedly to mathematics, from which he was determined, if possible, to keep him, lest he should, by this pursuit, be prevented from learning the languages. He accordingly locked up all the books that treated of geometry, and the sciences properly called, and refrained even from speaking of them in his presence. On one occasion, however, the youth asked, with an importunity not to be put off, what was geometry? to which the father replied, "geometry is a science which teaches the way of making exact figures, and of finding out the proportions between them;" but at the same time, he forbade him to speak or think of the subject any more, which was perhaps the very readiest way to excite in him an earnest desire to become acquainted with it. Accordingly the science soon occupied all his thoughts; and though but twelve years of age, he was found, in the hours of recreation, making figures on the chamber-floor with charcoal, the proportions of which he sought out by means of a regular, though perhaps uncouth, series of definitions, axioms, and demonstrations. It is said, apparently upon unquestionable authority, that he had proceeded with his inquiries so far as to have come to what was just the same with the thirty-second proposition of the first book of Euclid, and that without any assistance either from living instructors, or the works of the illustrious dead. From this time, young Pascal had full liberty to indulge his genius in mathematical pursuits, and was furnished by his father with Euclid's Elements, of which he made himself master in a very short time. So great was his proficiency in the sciences, that, at the age of sixteen, he wrote a "Treatise on Conic Sections," which, in the judgment of the most learned men of the time, was considered as a great effort of genius. At the age of nineteen he contrived his admirable arithmetical machine, furnishing an easy and expeditious method of making arithmetical calculations, in the fundamental rules, without any other aid than that of the eye and the hand. About this time, owing to ill health, he was obliged to suspend his studies, which he was unable to renew for four years; when having been witness to the famous

Torricellian experiment respecting the weight of air, he instantly directed his attention to discoveries in the science of pneumatics. He made a vast number of experiments, of which he circulated a printed account through the whole of Europe. He soon ascertained the fact of the general pressure of the atmosphere, and composed a large treatise, in which he fully explained the subject, and answered the objections which were advanced against his theory: afterwards, thinking it too prolix, he divided it into two small treatises, one of which he entitled "A Dissertation on the Equilibrium of Fluids;" and the other, "An Essay on the Weight of the Atmosphere." These treatises were not published till after the author's death.

The high reputation which M. Pascal had acquired, caused him to be looked up to by the most considerable mathematicians and philosophers of the age, who applied for his assistance in the resolution of various difficult questions and problems. Among other subjects on which his ingenuity was employed, was the solution of a problem suggested by Mersenne, which had baffled the penetration of all who had attempted it: this was to determine the curve described in the air by the nail of a coach-wheel, while the machine is in motion; which curve was at that time known by the name of the *roulette*, but is now designated the CYCLOID; to which article we refer our readers for a farther account of the matter.

Before this time he had drawn up a table of numbers, which, from the form in which the figures were disposed, he called his "Arithmetical Triangle." He might perhaps have been an inventor of it, but it is certain that it had been treated of, a century before Pascal's time, by Cardan, and other arithmetical writers. See TRIANGLE.

When M. Pascal was in the 24th year of his age, and the highest expectations were formed of the advantages to be attained in science from his labours, he on a sudden renounced the study of mathematics, and all human learning; devoted himself wholly to a life of mortification and prayer; and he now became as great a devotee as almost any age has produced. From this period he renounced all kinds of pleasure, and not only denied himself the most common gratifications, but was in the habit of daily entrenching some part of his dress, food, &c. which he did not consider as necessary. He carried the matter much farther, and endeavoured to diminish his attachment to his dearest friends, because ardent affection was due to God alone. He occasionally wore an iron girdle, full of blunted points, to increase his mortification and pain, and to remind him of his duty to God. During the latter years of his life, his principal relaxation from the rigorous system which he prescribed to himself, consisted in visits which he paid to churches, where some relics were exposed, or some solemnity observed; and for that purpose he had a spiritual almanack, or ephemeris, which informed him of the places where particular services were performed. He was not, however, so completely abstracted from the world, as to be wholly indifferent to what was passing in it; and in the disputes between the Jesuits and Janfenits, he became a partisan of the latter, and wrote his celebrated "Provincial Letters," published in 1656, under the name of Lewis de Montalte, in which he only employed his talents of wit and humour in ridiculing the former. These letters have been translated into almost all the European languages, and probably nothing did more injury to the cause of the Jesuits. They attempted various answers, but with little effect: they then obtained a decree of condemnation against them, but they still maintained their ground, interesting the more serious readers by their solidity, and those of a lighter turn of mind by their wit. After the publication

publication of the "Provincial Letters," he became entirely a recluse, spending his whole time in meditation and prayer. He made his own bed, and performed almost all other menial offices; employing a servant only to dress his food, and to go on unavoidable errands. He allowed himself nothing in his apartment but a table, a bed, and two or three chairs. This course of life proved unfavourable to his health of body and mind. His reason became in some measure affected, and, in these circumstances, an accident produced on his mind an impression which could not be effaced. In 1654, while he was crossing the Seine in a coach and four, the two leading horses became unmanageable at a part of the bridge where the parapet was partly down, and plunged over the side into the river. Their weight fortunately broke the traces, by which means the other horses and the carriage were extricated on the brink of the precipice. From this fright it was difficult to excite the feeble Pascal, and he never afterwards had the possession of his mental faculties. He always imagined that he was on the edge of a vast abyss on the left side of him, and he would at no time sit down till a chair was placed there, to assure him there was no real danger. After languishing some years in this miserable state, he died at Paris in 1662, at the age of 39. He intended to have written a work against atheists and unbelievers in Christianity, and had collected a mass of materials for that purpose, which he did not live long enough to digest. These consisted of reflections upon devout, moral, and other subjects connected with the evidences of the Christian religion, which were written down by him at different times, on the first piece of paper which he could find. After his decease, these pieces of paper were found filed, but without any order or connection; and being exactly copied, were arranged and published in 32 chapters, under the title of "Pensées de M. Pascal sur la Religion et sur quelques autres Sujets." They have been translated in our own and other languages, and have been greatly admired as the precious remains of a great and a good, though certainly a misguided, man. They exhibit, in the original language, striking traits of his sublimity of genius, beautiful turn of sentiment, as well as force and true elegance of expression. Many of the ideas do not reflect honour on the wisdom and benevolence of the deity; and on some of them Voltaire has written able animadversions, in his "Lettres Philosophiques."

The works of M. Pascal were collected and published in five volumes, octavo, in 1779, at the Hague, and also at Paris. This collection, which consisted in part of posthumous pieces, was given to the public by the abbé Bossu, who thus describes the author: "This extraordinary man inherited from nature all the powers of genius. He was a geometrician of the first rank, a profound reasoner, and a sublime and elegant writer. If we reflect that, in a very short life, oppressed with continual infirmities, he invented a curious arithmetical machine, the elements of the doctrine of chances, and the method of resolving various problems respecting the cycloid; that he fixed, in an irrevocable manner, the wavering opinions of the learned concerning the weight of the air; that he wrote one of the most perfect works existing in the French language; and that in his own "Pensées," there are passages, the depth and beauty of which are incomparable; we can hardly believe that a greater genius ever existed in any age or nation." Bayle pronounces M. Pascal to have been one of the sublimest geniuses whom the world ever produced; and says, if he might make use of the expression, he would call him "a paradoxical individual of the human species." Voltaire, also, who did not spare the posthumous works of Pascal, says, in his

"Siècle de Louis XIV.," that the "Lettres Provinciales may be considered as a model of eloquence and humour. The best comedies of Moliere have not more wit than the first part of them; and the sublimity of the latter part is equal to any thing in Bossuet." In another place, speaking of this same work, he says, "that examples of all the various kinds of eloquence are to be found in it. Though it has been written almost an hundred years, yet not a single word occurs in it favouring of that vicissitude to which living languages are so subject. Here then we are to fix the epoch, when our language may be said to have assumed a settled form." In a moral point of view, as well as an adept in science and literature, Pascal has been most highly applauded. "His heart," says his biographer, "was the seat of the purest benevolence; and his exertions in alleviating the miseries, and contributing to the happiness of the unfortunate and indigent, were limited only by the extent of his means. Though his abilities entitled him to assume an air of superiority, he never displayed that haughty and imperious tone which is commonly observable in men of shining talents, but was distinguished by uncommon modesty and humility." Moreri. Bayle.

PASCALANK, in *Geography*, a river of North Carolina, which runs into Albemarle sound, N. lat. 36° 6'. W. long. 76° 32'.

PASCALIA, in *Botany*, so named by Professor Ortega, whose work we have not at present an opportunity of consulting, but we presume the genus is designed to commemorate some botanist. Ort. Dec. 4. 39. Willd. Sp. Pl. v. 3. 2228. — Class and order, *Syngenesia Polygamia-superflua*. Nat. Ord. *Compositæ oppositifoliæ*, Linn. *Corymbifera*, Juss.

Gen. Ch.

Ess. Ch. Receptacle chaffy. Seeds pulpy. Down a toothed border. Calyx imbricated.

1. *P. glauca*. Ort. Dec. 4. 39. t. 4.—Native of Chili. Root perennial. Stem erect, eighteen inches high, slightly branched in the upper part only. Leaves opposite, sessile, smooth, glaucous; the lower ones ovate, with angle-like teeth, three-ribbed, veiny; the upper ones lanceolate, narrow, three-ribbed, obscurely toothed towards the base. Flowers yellow, solitary at the summits of the stem and branches. The pulpy or drupaceous seeds appear to render this genus, as Willdenow observes, very distinct.

PASCATAQUA, in *Geography*. See PISCATAQUA.

PASCHAL I. pope, in *Biography*, a Roman by birth, who flourished in the ninth century, became a presbyter of the church, and abbot of the monastery of St. Stephen. In the year 817, upon the death of pope Stephen V., he was elected his successor, by the unanimous suffrages of the senate, the clergy, and people. Immediately after his elevation to the pontifical throne, he sent his nomenclator Theodore into France, to carry the tidings of his elevation to the emperor Lewis, who sent him assurances of his protection, and conferred the grants which had been made by his father and grand-father to the holy see. No sooner was his election known in the East, than letters were sent to him from the monk Theodore Studita, and the other defenders of image worship, containing grievous but very exaggerated complaints of the persecution which they suffered from the ICONOCLASTS (see the article); and exhorting him to assemble a council for the purpose of anathematizing those heretics. This measure he refused to adopt, but sent letters to the complainants, confirming them in their adherence to their usual practice; and to comfort them under their sufferings, he assured them that to be martyrs on account of Images, was in fact to be martyrs on account of Christ; and that the same reward was reserved in heaven for those who suffered under the Image-breaking

breaking emperors, which was conferred on those who suffered under the Pagan emperors for the sake of Christ. In the year 818, Paschal built a monastery at Rome for the Greek monks who had fled from Constantinople, and the other cities of the East, rather than renounce the worship of images. In the year 823, Lotharius, the eldest son of the emperor Lewis, who had taken him for his partner in the empire, came to Rome, where he was received with every possible mark of respect and distinction, and crowned by him emperor and king of Italy. Scarcely had the monarch returned to France, when two of his adherents were cruelly murdered at Rome. Lewis instantly sent commissioners to examine if the pope were at all implicated in the transaction, but after the strictest enquiry no certain information could be obtained as to the guilt or innocence of Paschal. They, therefore, acquiesced in an offer which the pope made of declaring his innocence upon oath. He could not be persuaded to deliver the assassins, alleging that they were his servants, and, in fact, guilty of no crime, since the persons who had been put to death had long and richly deserved that punishment by their treasonable practices. The pope died in February 824, and so firmly was it believed that he was privy to the assassination which his servants had perpetrated, that the people would not allow him to be interred with his predecessors in the Vatican, and he remained unburied till his successor caused his remains to be deposited in one of the churches that he had rebuilt. Three letters that have been attributed to him are inserted in the seventh volume of the "Collectio Conciliorum;" but very considerable doubts are entertained of their genuineness. Moreri. Bower.

PASCHAL II. pope, originally called Rainerius, or Ragnerus, was a Tuscan by nation, and was educated in the monastery of Cluny, where he embraced the monastic life while he was very young. At the age of 20, he was sent by his abbot to Rome on business relating to the monastery, when Gregory VII., who was then on the pontifical throne, struck with his talents and behaviour, retained him at his court, and, in a short time, he was ordained priest, and soon after was promoted to the dignity of cardinal, with the title of St. Clement. In 1099, upon the death of pope Urban II., the cardinals, bishops, and clergy of Rome, having assembled in the church of St. Clement, determined to elect cardinal Rainerius; he wished to escape, and withdrew himself, but being discovered, he was brought back, and unanimously placed on the pontifical throne. On the following day his consecration took place, when he assumed the name of Paschal II. His first object was effectually to crush his rival Guibert, who had maintained the name of pope for nearly 20 years, and had given considerable trouble to three of his predecessors. In this the new pope soon succeeded; attempts were made to introduce other rivals, but the interest of Paschal completely prevailed, and having secure possession of the apostolical chair, he began the exercise of his pontifical office by sending legates to France to remonstrate with king Philip on account of his living in open adultery with Bertrada, the countess of Anjou, and to cut him off from the body of the church, should not admonition bring him to a sense of his duty. The legates were unable to convince the adulterers of the errors of their conduct, and accordingly excommunicated them. In the year 1101 the pope, through the interest of Anselm, archbishop of Canterbury, attempted to introduce his own unlimited power into England, and sent over Guido, archbishop of Vienne, with the character of his *legate a latere*; but when king Henry and the nation understood that he was commissioned to exercise in this kingdom the same uncontrolled power over all persons which had been displayed in other countries, they would not acknow-

ledge him, nor was he allowed to exercise any function of his office. (See ANSELM and HENRY I.) In the following year Paschal assembled a council at Rome, in which the decrees of his predecessors against investitures were confirmed, and the pope himself, with great solemnity, and in the presence of an immense multitude, pronounced the sentence of excommunication against the emperor Henry IV. This prince was afterwards glad to abdicate his throne in favour of his son Henry V. Upon the death of the former the pope held a council, in which decrees were passed which re-united the whole of Lombardy to the apostolical see, from which all that country, excepting the places held by the countess Matilda, had been separated ever since the year 1080, when it declared in favour of the antipope Guibert. By this time the pope had the mortification to find, that the new emperor was determined, equally with his predecessors, to maintain his right to investitures; the pope, therefore, to strengthen his own hands, sought an alliance with Philip of France, whom he had, some time previously to this, absolved from the sentence of excommunication. An attempt was made by Henry to terminate all differences with Paschal, but as he would not recede in the least from his claims, the object was not accomplished. In 1107 the pope presided in a council at Troyes, consisting of the bishops from many places, who proved themselves to be wholly subservient to the ambition of the court of Rome, by confirming all the decrees relating to the pretended papal right to investitures. In 1110 a compromise took place, and in the following year Henry set out for Rome, at the head of a numerous army, to be crowned. He was received with every mark of respect, but when the conditions of the treaty were to be mutually fulfilled, the German and Italian bishops present protested unanimously against parting with their estates, which they said the pope had no right to dispose of. This produced a warm altercation between the king and the pope, Paschal declaring that he would not proceed with the coronation unless the monarch immediately ratified his part of the treaty. Henry, in reply, ordered his guards to arrest the pope and all his cardinals, thinking that, by this measure, he should compel Paschal to crown him. Two of the cardinals contrived to escape in disguise, and they animated the citizens of Rome to fly to arms, to rescue their pontiff. A civil contention took place, in which the friends of the pope were repulsed with great slaughter. After Paschal had been prisoner about two months, the monarch swore, in the presence of his army, that if he did not fulfil the articles of agreement, he would put him, and all his adherents, to death. The pope was still unmoved, till the cardinals, and other prisoners, begged him to yield for their sakes, and to prevent the calamities which must otherwise fall upon the church. The articles of agreement were accordingly signed, and the monarch received a papal bull, confirming to him the right of investiture. Things being thus settled, the pope and Henry proceeded to the church of St. Peter, where the king was crowned emperor of the Romans by the pope, with the usual solemnity; soon after which that prince took his leave of his holiness and returned to Germany. Paschal's reception at Rome was highly mortifying, he was accused of having sacrificed the rights of the church, and the dignity of his station, to his own safety. He affected great contrition, and sanctioned the excommunication of the emperor. Hostilities were carried on by both parties till 1117, when Henry resolved to bring matters to a crisis, and set out a second time for Italy, at the head of a numerous army. The contests now were carried on with great violence, till the beginning of the following year, when the pope died, after a reign of about eighteen years and a half, which he

spent in incessant efforts for extending the power, and promoting the aggrandisement of the papal see. More than 100 of his letters, and some fragments of his decrees, are inserted in the 10th vol. of the Collect. Concil. Moreri. Bower.

PASCHAL III. pope, or antipope, originally known by the name of Guy de Crema, was probably a native of the city whence he derived his surname. He was promoted to the sacred college by pope Adrian IV. who sent him into Germany as legate to appease the resentment of the emperor Frederic Barbarosa, which he had provoked by his exorbitant and arrogant claims to the temporal power and authority. He was not successful in the object of his mission; on the death of Adrian, in 1159, the cardinals were divided into two parties, the greater number of whom declared the election to have fallen upon Alexander III., while the minority, in which Guy was one, gave votes for cardinal Octavian, who had long aspired to the pontificate, and was even prepared to support his pretensions by an armed force. A double election took place, and the two rivals were consecrated by their respective partizans, on which occasion Octavian assumed the name of Victor. Supported by the emperor, he retained the pontifical dignity till his death in 1164, when cardinal Guy was chosen his successor, and took the name of Paschal III. This election was confirmed by the emperor, and in 1166, Paschal was acknowledged in the character of sovereign pontiff by the bishops and princes of the empire at the diet of Wurtzburg. The Romans, however, declared for Alexander, and received him with the same honours which had been paid to his predecessors. A furious contest was excited, but at length the greater part of the Romans submitted, and acknowledged Paschal as lawful pope. He died in 1168, after he had held the title about four years. One of the chief acts which he performed in this character was the canonization of Charlemagne in the year 1165, but as the Roman church classes Paschal among the antipopes, it does not agree to the honours of sainthood which are paid to that prince.

There was another antipope of the name of Paschal, who created a schism in the Roman church in the seventh century. He held the office of archdeacon, and upon the death of Conon, in 687, aimed at the papacy, and was elected by his friends to the high dignity, but in the end he was deposed even from the more humble office of archdeacon, and shut up in a monastery, where he died in about five years.

PASCHAL, *Paschalis*, something belonging to the Jewish passover, or to the Christian Easter.

The paschal lamb was a lamb which the Jews eat with great ceremony, in memory of their having been brought out of slavery in Egypt. It should be eaten standing, their loins girt, the staff in hand.

PASCHAL Canon. See CANON.

PASCHAL Taper. See TAPER.

PASCHAL Rents, are rents or annual duties paid by the inferior clergy to the bishop, or archdeacon, at their Easter visitations.

They are also called *synodals*.

PASCHAL Letter, in *Church History*, a circular letter, which the patriarch of Alexandria first, and afterwards the pope, anciently wrote to all the metropolitans; to inform them of the day whereon the feast of Easter was to be celebrated.

PASCHASIUS-RADBERT, in *Biography*, a celebrated French monk, who flourished in the ninth century, to whose writings Protestant controversialists trace the origin of the doctrine of transubstantiation, was a native of Soissons, and being deserted in his infancy by his relations, he was brought

up by the charity of the nuns in an out-house dependent on their convent. When he had attained to manhood, he embraced the monastic life among the Benedictines of the abbey of Corbie, where he applied, with great diligence, to his studies; became distinguished in polemic conferences, and wrote several books. In 844, when he was only in deacon's orders, he was, on account of his high reputation, elected abbot, which he soon after resigned, and returned to the simple condition of monk, spending the remainder of his life in the exercises of the cloister, close study, and the composition of various books. The first work which he gave to the public was a treatise "Concerning the Sacrament of the Body and Blood of Christ," composed by him in the year 831. In this he pretended to explain the doctrine of the church on this head, maintaining that after the consecration of the bread and wine in the Lord's supper, nothing remained of these symbols, but the outward figure, under which the body and blood of Christ were really and locally present, and that the body of Christ thus present in the eucharist, was the same body that was born of the virgin, that suffered on the cross, and was raised from the dead. That this doctrine was then new, may be concluded from the great astonishment which it excited, and the general opposition which it met with from the learned men of the age. Mosheim has given an abstract of the controversy to which this publication gave rise. In the year 846, Paschasius published a treatise entitled "De Partu Virginis," intended to support an opinion propagated at that time by certain German doctors, that Jesus was born in a manner entirely different from those general laws of nature that regulate the birth of the human species. He was author of many other pieces, all which were collected and published by father Sirmond in 1618, in one volume folio. They are also to be found in the fourteenth vol. of the Bibl. Patr. Moreri. Priestley, Hist. of the Christian Church. Mosheim.

PASCHIUS, GEORGE, a learned German Lutheran divine, was the son of a tradesman at Dantzic, where he was born in the year 1661. When he had completed his studies, he travelled for further improvement in Germany, France, and England. In 1701 he obtained the appointment of professor of moral philosophy at Kiel in Holstein, and in 1706 he was nominated professor extraordinary of divinity in the same university. He died in the following year at the age of forty-six. He was author of various publications, abounding in curious and highly useful learning. His first and principal work was published in 1695, entitled "Tractatus de novis inventis, quorum accuratori Cultui Facem prætulit Antiquitas," which afterwards appeared in a new and enlarged form in 1700, under the title of "Inventorum novantiquorum." It is a work replete with profound enquiries, and calculated to exalt former times at the expense of the present. The author attempts to prove, that the knowledge of the moderns has been imperceptibly borrowed from the rich stores of ancient wisdom, and that our boasted inventions are only improvements on the discoveries of the ancients. In endeavouring to establish his point, he brought forward a number of interesting facts relating to the history and progress of the arts and sciences. One of the other works of this author was entitled "De fictis Rebus publicis," being a treatise on the imaginary republics of Plato, sir Thomas More, and Campanella. The titles of his other pieces may be found in the General Biography, to which we refer the readers.

PASCOMAYO, in *Geography*, a sea-port of Peru, in the bishopric of Truxillo, and jurisdiction of Lana, at the mouth of a river of the same name.

PASEWALK, a town of Anterior Pomerania, situated

on the Ucker, by means of which the inhabitants transport their goods to the great Haff. In its vicinity are some iron works; 21 miles W. of Old Stettin. N. lat. 53° 30'. E. long. 13° 57'.

PASH, or PASHA, in *Mythology*, is an attribute or implement of several of the deities of the Hindoos. It seems to be an implement of punishment, a whip or lash to chastize, or cord to strangle, sinners. A doubled cord is often seen in the hand of Parvati, in any of her terrific or avenging characters, and it is to such characters that the pasha is chiefly confined. (See KALI.) In Hindoo books the pasha is frequently mentioned, and it is generally distinguished by the name of the deity to whom it is attributed. Thus the Varuna-pasha is the cord of Varuna, the Hindoo Neptune. "Varuna," says Menu, "most assuredly binds the guilty in fatal cords," ch. xi. v. 308. "The Dherma-pasha, the dreadful Kalapasha, and the highly valued Varuna-pasha," are mentioned in the Ramayana, as part of the "weapons, missile and manual," with which the gods armed Rama for the war of Lanka. They severally mean the cords of Justice, of Death, and of Varuna.

PASHA. See BASHAW.

PASHAUNA BEADY, in *Natural History*, a name given by the people of the East Indies to a kind of fibrous talc, found in the sides of the mountains, and used in medicine with them. They calcine it, and then powder and boil it in milk, and give half a dram for a dose mixed in milk, for the gravel and stone.

PASI, ANTONIO, of Bologna, in *Biography*, a disciple of Pistocche, highly extolled by the greatest masters of his time. Mancini, in his "Treatise on Singing," says that he was gifted with a taste and intelligence in the art of singing which were wonderful. To a very simple method, and a clear and dignified *portamento*, or carriage of his voice, he was the first who united those little licences which produce the greatest effects. By this art his style became extremely singular and piquant. But he had then and since many bad imitators, who abused the art of which he was the original, and by a redundancy of ornaments so disguised and disfigured the melody, that it became wholly unintelligible. Yet, from the ambition of shining by variations and heterogeneous ornaments, they lost the true expression of that melody which was thought so essential to music, which was the boast of the end of the 17th century, and the beginning of the next; but it is to be feared that it has not since been found.

PASICANA, in *Ancient Geography*, a town of India, on this side of the Ganges. Ptolemy.

PASIDIUM, a town of Asia, in Syria, situated on the sea-coast, W. of mount Casius.

PASIGA, in *Geography*, a river which rises in the province of Darien, and runs into the bay of Panama.

PASIGRAPHY, in *Literary History*, the art of universal writing. This art was suggested by lord Bacon in his "Instrument of Discourse;" where he says, "it is possible to invent such signs for the communication of our thoughts, that people of different languages may, by this means, understand each other; and that each may read immediately, in his own language, a book which shall be written in another." Lord Bacon did not think, however, of confining this, as citizen Memieux has lately proposed to do, to 12 characters, which may be learned in 12 hours; on the contrary, he requires a great number, at least as many as the number of radical words; on which head he quotes the example of the Chinese; "and although," he adds, "our alphabet may appear more commodious than this method of writing, the thing itself is nevertheless well deserving of attention. The problem relates to the signs by which thoughts may be rendered

current; and as money may be struck of other materials as well as of gold and silver, it is possible likewise to discover other signs of things as well as letters and words." Des Cartes, in his third letter to father Merfennus, discusses the invention of a Frenchman, whom he does not name, but who, by means of a certain language and an artificial writing, pretended to understand all the different idioms. He remarks on this subject, that it would be very possible to compose a short and convenient grammar, with general signs, which should render all foreign languages intelligible. In the year 1661, John Joachim Becher published a Latin folio, entitled "Characters for the Universal Knowledge of Languages; a Steganographic Invention hitherto unheard of." This was in effect paligraphy; or a method of making one's self understood by all foreigners by writing in one's own language, and also of comprehending what they write in theirs. Becher, being the first who gave a complete treatise on this art, may be considered as the inventor. He begins his work by a set of very delicate and highly interesting observations upon general grammar, and the fundamental relations of all languages with regard to each other. He gives a learned comparative table of the relations and harmony of the Latin, the Greek, the Hebrew, the Arabian, the Slavonian, the French, and the German. This work cannot be too highly esteemed, and assuredly was not unknown to the author of the work "Du Monde Primitif." A Latin dictionary then follows, in which every word corresponds with one or more Arabic numeral figures arbitrarily taken. Every number is assumed as distinctive, or denoting the same word in all languages; and consequently nothing more is required than to compose a dictionary for each, similar to that which he has given for the Latin. There is likewise a table of declensions and conjugations, which presents certain determinate numbers for all the cases, moods, tenses, or persons. By means of this general disposition, when a Frenchman is desirous of writing to a German the following phrase, *La guerre est un grand mal* (war is a great evil), he seeks in his index, *guerre, être, grand, mal*; and he writes the correspondent numbers,

13, 33, 67, 68.

The sentence might be understood by these four characteristic numbers; but to leave no room for ambiguity, he says, *Guerre* is the nominative case, and finds, as the characteristic of the nominative, the Arabic figure 1. *Est* is the third person singular of the indicative mode, present tense, of which the characteristic is 15. To *grand*, and to *mal*, belong likewise the figure 1, for the nominative case; he will therefore write

13.1 | 33.15 | 67.1 | 68.1

where the numbers are separated by small vertical bars to prevent confusion. It may easily be conceived how, by the inverse method, the German will find in his tables the words denoted by the cyphers, which will form *Der krieg ist ein grosses uebel*.

This invention of Becher, which is the same thing nearly with regard to language, as algebra is to arithmetic, could not have cost him any great effort of the imagination; and it evidently reduces itself, as is the case with regard to all paligraphy, to the learning a new language, or having a dictionary at hand for use. It is besides possessed of considerable simplicity, and even a few hours practice will render it easy. If any reader should be curious to see more applications of this kind, he may have recourse to the Latin work of Sturmius, "Essais d'Expériences curieuses," probably the "Collegium experimentale, five curiosum, &c. Joannis Christophori Sturmii," 4to. Norimberg, 1701.

In the same year George Dalgarme, an Englishman, published at London, a work of which the prolix title is sufficient to shew its object. It is "The Art of Signs, or an Universal Character and Philosophical Language, by means of which, Men of the most different Idioms may, in the Space of two Weeks, learn to communicate, whether by Word of Mouth or by Writing, all their Thoughts, as clearly as in their Mother Tongue. Besides which, young Persons may therein learn the Principles of Philosophy, and the Practice of true Logic, more speedily and more readily than in the ordinary philosophic Writings." The book of Dalgarme is written in Latin. Beckmann accuses him of extreme pedantry. His characters likewise were cyphers.

Joachim Frisichius, professor at the Gymnasium at Riga, was employed on a similar attempt, namely, to introduce a natural, rational, and universal language, of which some sheets printed at Thorn in 1681 may give an idea. The death of the author interrupted his labours. He purposed to call his new language Ludovicean, in honour of Louis XIV. under whose patronage he pursued his labours; a prince who extended his generosity to the learned of all countries.

The curious in researches of this nature may also find a project of this kind in a folio volume published at Rome in 1665, by the celebrated mathematician Athanasius Kircher, the title of which is, "A New and Universal Polygraphia, deduced from the Art of Combination;" and by means of which, says Morhoff (*Polyhistor*. l. ii. c. 5.), he who understands one single language only may correspond in writing with all the nations of the earth.

It would be perhaps unjust to pass in silence the little-known work of father Besnier, Jesuit, who, in a book entitled "La Réunion des Langues, ou l'Art de les apprendre toutes par une seule," that is, The Union of Languages, or Art of learning all Languages by one alone, printed at Paris in 1674, has given several intimations which lead directly to pagigraphy.

The most remarkable work of all which has been written on this subject is, perhaps, that for which we are indebted to bishop Wilkins, the brother-in-law of Cromwell. It is entitled "An Essay towards a Real Character and a Philosophical Language," London 1668. It is divided into four parts. I. Considerations on the various languages, their defects and imperfections, from which a philosophical language ought to be exempt. II. Philosophical enquiries respecting all the things and notions to which proper names ought to be assigned. III. The organic science of native grammar considered as the necessary means of representing simple ideas in discourse. IV. The application of the general rules to every character and language. Examples, &c. This concise outline sufficiently shews the importance of the work.

In his appendix, the author explains the utility of a method of writing without alphabetic characters, by means of signs, which are to be used to denote all the principal ideas, the relative attributes being designated by small strokes added at right, acute, or obtuse angles, to the right or left, &c. Of principal or chief ideas he admits but forty, under which he ranges all the others, by that means forming a kind of categories. His new language is calculated to afford great facility of comprehension, and new openings to the reasoning processes of science. A learner might make more progress in it in a month, than in the Latin in several years. The Chinese writing, which is a very complicated pagigraphy, has given two learned men the idea of forming one upon a more simple plan. The first is Caramuel, in his "Apparat Philosophique," p. 128; and the other Andrew Muller Grieffenbag, in his "Clé Chinoise." The latter promised to teach

to women and children, in the course of a few days, a kind of writing by which all the several languages should be rendered intelligible to them.

After so many attempts more or less philosophical, and of different degrees of perfection, with others probably of which we know nothing, we must not overlook the efforts of the celebrated Leibnitz for the introduction of a pagigraphy. His history and development of a characteristic universal language is in every library. Leibnitz exhibited, and with reason, his universal characteristic as the art of inventing and judging. He was convinced that an alphabet might be formed, and of this alphabet such words as would afford a language capable of giving mathematical precision to all the sciences. "Men may thus acquire," says he, "as it were a new organ, which would add energy to their moral faculties, as the microscopic lens increases the power of the eye. The compass is not more highly valuable to the navigator, than this philosophical language would be to him who embarks on the sea of reason and experiment, which is now so full of danger."

We must not forget the ingenious method of the abbé de l'Épée, who, by means of the same identical gestures, dictated to his deaf and dumb pupils certain discourses, which they wrote with equal readiness in four languages. Nothing can more assuredly resemble a true pagigraphy than these gestures.

The abbé de Condillac, a subtle metaphysician, particularly with regard to human language, has not neglected signs and characters. In his "Art of Thinking" (*Art de Penser*), in his "Art of Writing" (*Art d'Ecrire*), and more particularly in his "Logic," he has shewn the advantages of a philosophical language, which should proceed perfectly in the order of the ideas, and of which the signs should be the most simple and analytical. He expressly reduces the study of all the sciences to that of a well constructed language, and quotes, as an example, algebra in the mathematical sciences. Nicholson's *Journal*, vol. ii. or Anderson, on an Universal Character. Dr. Brown's Hints on the Establishment of an universal written character. See CHARACTERS, LANGUAGE, and WRITING.

PASIN, in *Geography*. See BADKIS.

PASIPEDA, in *Ancient Geography*, a town of India, on the bank of the Ganges, and on this side of it, between Pisca and Suficana. Ptolemy.

PASIRIS, a town of European Sarmatia, on the bank of the river Carcinite, between Torocca and Hercabum. Ptolemy.

PASITIGRIS, a name given to the junction of the Euphrates and Tigris, at the mouth of the Persian gulf.

PASKA, in *Geography*, a town of Africa, in the kingdom of Fonia, in which the king keeps a garrison of 100 men. The town is surrounded with palisades, and contains about 100 inhabitants.

PASKARETI, a town of Mingrelia; 20 miles N.N.E. of Anarghia.

PASKATAQUES, a large branch of Penobscot river, on its W. side, which waters more than 50 miles, and receives 10 tributary streams.

PASKAU, a town of Moravia, in the circle of Prerau; eight miles E. of New Titschein.

PASLAKEN, a town of Prussia, in Bartenland; 10 miles S.E. of Bartenlein.

PASMAN, an island of the Adriatic, near the coast of Dalmatia, 15 miles long, and two broad, which contains seven villages, and produces wine and oil in abundance. N. lat. 44° 8'. E. long. 15° 56'.

PASO FERREIRA, a town of South America, in the government of Buenos Ayres; 340 miles N.N.W. of Buenos Ayres.

PASO de Pefcado, a town of South America, in the province of Tucuman; 50 miles N. of St. Miguel de Tucuman.

PASOLATO, a river of Sicily, which runs into the sea, on the south coast, N. lat. 36° 49'. E. long. 13° 32'.

PASOMDSO, a lake of Thibet, about 50 miles in circumference. N. lat. 29° 42'. E. long. 94° 24'.

PASPALUM, in *Botany*, apparently so called from *πασπαλη*, an ancient name for Millet, which kind of grain this grass resembles in the appearance of its small round seeds; see *Panicum italicum*. *Πασπαλη*, or *πικιπαλη*, is also a name for any fine meal or flour, as Professor Martyn remarks. Linn. Gen. 32. Schreb. 46. Willd. Sp. Pl. v. 1. 330. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 138. Brown Prodr. Nov. Holl. v. 1. 188. Juss. 29. Lamarek Illustr. t. 43. Gærtn. t. 80. Class and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. Cal. Glume of two membranous, equal, almost orbicular, slightly concave valves, containing one floret; the inner one flattest, turned from the dilated unilateral receptacle. Cor. of two roundish, cartilaginous valves, the size of the calyx, externally convex, inflexed at the base. Nectary of two membranous scales at the base of the germen. Stam. Filaments three, capillary, the length of the calyx; anthers ovate. Pist. Germen superior, roundish; styles two, capillary, the length of the corolla; stigmas pencil-shaped, hairy, coloured. Peric. none, except the permanent closed glumes. Seed solitary, roundish, compressed, convex at one side, coated by the permanent cartilaginous corolla.

Eff. Ch. Calyx of two valves, nearly orbicular, single-flowered. Corolla of the same size and shape, compressed. Stigmas pencil-shaped. Seed coated with the hardened corolla. Common receptacle unilateral.

Obs. Mr. Brown remarks, that this genus is very closely related to *Panicum*, inasmuch that if, in those species of the latter which have an unilateral spike, the outer valve of the calyx be suppressed, it makes a real *Paspalum*. Such a defect does, according to this botanist, actually take place in some few, in which, however, either the nectariferous scales, as Linnæus thought them, or a very minute valve within the inner valve of the calyx, do indeed sometimes occur; but so likewise is a small valve, on the outside of the least convex valve of the corolla, sometimes observable, says Mr. Brown, in *Paspalum orbiculare*. There is a peculiar aspect of neatness, arising from the more or less perfectly orbicular form, and regular arrangement, of the flowers, which characterises the genus before us.

Linnæus at first referred such of its species as he knew, to *Panicum*, but in Syft. Nat. ed. 10. v. 2. 1359, he gives the generic character of *Paspalum* at length, for the first time, enumerating four species in p. 855 of the same volume, which were all he then knew. He subsequently, as we shall find, confused the history of the first of them, *dimidiatum*, in such a manner, that it could not be developed, but by investigation of his specimens and manuscripts. He erred at first in considering the genus as *dianthous*, but this is corrected in his *Species Plantarum*. The history of the species has hitherto been so imperfectly detailed, that we shall attempt a more ample, if not a complete one.

1. *P. dissectum*. Linn. Sp. Pl. ed. 2. 81. (*P. dimidiatum*; Syft. Nat. ed. 10. v. 2. 855. *Panicum dissectum*; Sp. Pl. ed. 1. 57. *Gramen panicum, spicâ simplicî, ad caulem intervallatâ, binis granorum ordinibus uno versu*

constante; Pluk. Mant. 9. Phyt. t. 350. f. 2.)—Spikes alternate, sessile, with a leafy, broad, rough-edged receptacle. Flowers smooth, slightly elliptical, three-ribbed. Leaves smooth. Stipula membranous, beardless.—Native of North America; sent to Linnæus by Kalm. Stem leafy, bent at the joints. Leaves linear-lanceolate, smooth, striated, a little rough at the edges, with long, rather tumid, smooth sheaths. Stipula membranous, jagged, unaccompanied by any hairs or bristles. Spikes three or four on the upper part of the stem, which scarcely rises above the leaves, each rather more than an inch long. Common stalk, or receptacle, of each spike much dilated, linear, exactly even, leafy, striated, rough-edged, one-eighth of an inch, or more, in breadth, having at its inner side a strong, angular, longitudinal rib, bearing numerous, alternate flowers, in two rows, on short stalks. The calyx-glumes are exactly but broadly elliptical, rather tumid, pale, with three fine green ribs, perfectly smooth and naked. Perhaps this may be *P. membranaceum* of Walter, Fl. Carolin. 75.

2. *P. setaceum*. Michaux Boreal-Amer. v. 1. 43.—Spikes one or two, on long straight stalks, with a narrow wavy receptacle. Flowers mostly in pairs, on short, winged, divided partial stalks, slightly obovate, smooth, scarcely ribbed. Leaves downy above. Stipula hairy. Sent from Lancaster, Pennsylvania, by the Rev. Dr. Muhlenberg. We at first confounded it with the former, but on examination it proves abundantly distinct, and answers well to the character in Michaux. The stem is erect, slender and smooth, terminated by one spike, two inches long, on a slender, stiff, naked stalk, many inches in length, whose base is folded by the very long sheath of the upper leaf, from which often proceeds another similar, but shorter-stalked, spike. The upper leaf, at least, is much shorter than its sheath, lanceolate, clothed above with soft hairs. Michaux says his plant grows in dry situations in South Carolina.

3. *P. debile*. Michaux *ibid.* 44.—“Stem weak, brittle-like at the top. Leaves hairy. Spike mostly solitary, slender. Flowers solitary, alternate, slightly downy, slightly obovate.”—Native of maritime situations, in Carolina and Georgia. This seems by Michaux’s character, which is all we know of it, to be akin to the last.

4. *P. conjugatum*. Bergius in Act. Helvet. v. 7. 120. t. 8. Willd. n. 12. Swartz Ind. Occ. v. 1. 133. (*P. dissectum*; Linn. Syft. Nat. ed. 12. v. 2. 86.)—Spikes two, terminal, equal, nearly sessile. Receptacle narrow, even, with a wavy rib. Flowers solitary, very numerous, alternate, imbricated, ovate, acute, ribless, fringed with long soft hairs. Common in the West Indies, in moist pastures. Linnæus obtained a specimen from Browne’s herbarium, which he confounded with the first species, though nothing can be more distinct. Hence the specific character of *P. dissectum* became corrupted in his Syft. Veg. which Willdenow has copied. The description however in the last-named author, copied from Sp. Pl. ed. 2, is right, except the downiness of the leaves. *P. conjugatum* is a larger species than any of the foregoing, with broad, taper-pointed, often downy leaves. Stipula hairy. Spikes two, on a level at the top of the stem, nearly sessile, slender, a little divaricated, each nearly four inches long, of innumerable, crowded, alternate, small, yellowish, ovate, acute flowers, each on a short stalk; their calyx ribless, remarkably fringed with long, lax, white hairs. One of our specimens bears a third spike, an inch below the others. Swartz says this is called, in the West Indies, Sour grass, and is not eaten by cattle.

5. *P. ciliatifolium*. Mich. Boreal-Amer. v. 1. 44.—“Leaves dilated, downy, finely serrated, fringed. Spikes one or two, terminal, elongated. Flowers in pairs, somewhat obovate,

PASPALUM.

vate, very obtuse, smooth, forming three rows.—Native of Carolina. *Michaux.* This seems akin to the last.

6. *P. praecox.* Walt. Carolin. 75. Mich. *ibid.* 44.—“Erect, smooth. Leaves linear, elongated. Spikes alternate, remote. Flowers short, obovate, even and smooth.”—Native of North America, from Carolina to Florida. *Michaux.*

7. *P. leve.* Mich. *ibid.* 44.—“Erect, very smooth. Leaves shortish; with compressed sheaths. Spikes several, alternate. Flowers in two ranks, ovate, somewhat orbicular, even and smooth.”—Native of Georgia. *Michaux.* We have adopted these three species from *Michaux*, that they might be recorded in a general view of the genus, though we are unacquainted with them. It seems the North American *Paspala* are but incompletely known; nor can we, by the above short, and far from scientific definitions, refer these to any in *Linnæus* or *Willdenow*. Two others, in the same predicament, will be noticed hereafter, among the species to which they may be presumed most nearly to belong.

8. *P. serobiculatum.* Linn. Mant. 29. Willd. n. 2. Ait. n. 1. Houtt. Nat. Hist. v. 13. 165. t. 89. f. 3. *Dryandr.*—Spikes alternate, with a leafy, broad, rough-edged receptacle. Flowers alternate, orbicular, on simple dilated stalks, many-ribbed, dimpled at the base externally.—Native of the East Indies, in watery places. Root perennial, of many long, blackish, branched fibres. Stem one or near two feet high, clothed with ribbed, smooth leaves; having long purplish sheaths, hairy at the bottom. Spikes few and distant; their receptacle flat, near a quarter of an inch wide, minutely fringed. Flowers not unlike hemp seed in size and aspect, very numerous, alternate, imbricated in two rows, each on a short, dilated, close-pressed partial stalk, and very nearly orbicular, tumid, smooth and naked, with numerous ribs near the margin, remote from the central one, the flatter valve of the calyx marked with a pair of depressions at the base.

9. *P. polyflachyum.* Brown n. 1.—“Spikes numerous, crowded. Flowers smooth, orbicular. Outer valve of the calyx five-ribbed. Leaves flat, smooth, with a thin finely-toothed margin.”—Gathered by Mr. Brown, in the tropical part of New Holland. This species is described by him as too nearly related to the last, except that the dimples in the base of the calyx are wanting. We have perceived that character to be doubtful or variable in various specimens of *P. serobiculatum*.

10. *P. villosum.* Thunb. Jap. 45. t. 8. Willd. n. 3.—Spikes alternate, with a hairy receptacle. Flowers alternate, elliptical, three-ribbed, villous.—Found by Thunberg, near Nagasaki in Japan, flowering in July. Stem three feet high, smooth. Leaves roughish to the touch, striated, naked. Spikes about three or four, inclining all one way. Flowers crowded, in two rows only, about the size of *P. serobiculatum*, but more oblong, and hairy. The receptacle is narrow, very hairy like the top of the stem. We have seen no specimen.

11. *P. virgatum.* Linn. Sp. Pl. 81. Willd. n. 4. (*Gramen dactylon majus, paniculâ longâ, spicis plurimis nudis crassis*; Sloane Jam. v. 1. 112. t. 69. f. 1.)—Spikes rather numerous, alternate, hairy at the base. Flowers in pairs, somewhat obovate. The tumid valve of the calyx fringed. Native of meadows in Jamaica. Perennial. About the size of *P. serobiculatum*, but differing in having smaller, obovate, fringed flowers, which being disposed in pairs along the narrow wavy receptacle, make four rows instead of two; each glume has a central rib, with a marginal one at each side, and the concave one is finely fringed in the upper part.

12. *P. floridanum.* Mich. Boreal-Amer. v. 1. 44.—“Erect. Lower leaves hairy; upper ones smooth, with long sheaths, upright. Spikes few, erect. Flowers in two rows, nearly orbicular, smooth, naked.”—Native of Florida and Georgia. This, says *Michaux*, is akin to *P. virgatum* of *Linnæus*. We know nothing of it but from the above character, which is essentially different in almost every point from the *virgatum*. *Michaux* adds that the flowers are rather large. We subjoin the only remaining species of that author, not knowing where else to place it.

13. *P. plicatum.* Mich. *ibid.* 44.—“Erect, very smooth and naked. Leaves elongated. Spikes numerous, alternate, upright. Flowers in three rows, short, ovate, naked. The flatter valve of the calyx transversely corrugated at the margin.”—Native of Georgia and Florida. The leaves are narrow. Flowers somewhat reddish.

14. *P. panicum.*—Spikes very numerous, crowded, hairy at the base. Flowers in four rows, orbicular, even and naked.—Gathered in Jamaica by W. Wright, M.D.—A very fine and handsome species, whose dense and very numerous spikes, crowded together into one common spike, a foot long, give, with their copious little round flowers and seeds, some idea of *Panicum italicum*, except that the whole is erect and unilateral. The leaves are long, near two inches broad in some parts, tapering to a rough-edged point, but otherwise very smooth to the touch, and finely ribbed. Each partial spike is two inches, or more, in length, with a flat rather narrow receptacle, bearing a few scattered hairs throughout, and very hairy at its base. Flowers disposed in four rows, on shortish capillary stalks, about the size of *Panicum italicum*, almost perfectly orbicular, of a light tawny hue, the calyx-valves even and smooth, each with a central rib, but no others, except at the very edge. This grass was formerly known in the Banksian herbarium, by the expressive name of *Paspalum polyflachyum*; now appropriated by Mr. Brown to our 9th species, which, from his description, must be very unlike the present.

15. *P. paniculatum.* Linn. Sp. Pl. 81. Willd. n. 5. Ait. n. 2. (*Gramen miliaceum, paniculâ viridi vel purpureâ*; Sloane Jam. v. 1. 115. t. 72. f. 2.)—Spikes numerous, crowded, somewhat whorled, spreading every way, hairy at the base. Flowers in alternate pairs, orbicular, even, slightly hairy.—Receptacle very narrow.—Sloane says this grows in several plantations in Jamaica, on a moist clay soil. The leaves are an inch wide, hairy on their upper side, as well as about the stipula on both sides; their sheaths long, smooth, ribbed. Common spike a span long, composed of numerous narrow spikes, two inches or more in length, partly scattered, partly whorled, spreading every way, each with an extremely narrow, though slightly winged, receptacle. Flowers numerous, small, rather loosely disposed in alternate pairs, on twin or combined stalks; their glumes very nearly orbicular, obtuse, somewhat hairy, single-ribbed.—Such is the genuine plant of Sloane and *Linnæus*; though the latter had in his herbarium another specimen, from which the particular description in *Sp. Pl.* was taken, but which is a very distinct species; see the following.

16. *P. repens.* Bergius in Act. Helvet. v. 7. 129. t. 7. Willd. n. 7. (*P. paniculatum*; Linn. Sp. Pl. 81, as to the description only.)—Spikes numerous, crowded, somewhat whorled, spreading every way, naked at the base. Flowers alternate, elliptical, acute. Leaves and receptacle rough.—Native of Surinam, according to Bergius, who describes the stem a foot or more in length, striated, smooth, jointed, leafy, creeping by means of fibrous roots thrown out at the joints. Leaves linear-lanceolate, acute, scarcely a finger's length, striated, downy, dark green, with a sheathing base, which

PASPALUM.

which in his figure and description is represented as flying off from the stem, probably in consequence of drying or pressure; the upper sheaths are smooth, the lower roughish, with minute points. *Stipula* oblong, membranous, lacerated, abrupt. *Spikes* numerous, slender, drooping, an inch or two long, the upper ones whorled, the lower opposite. *Receptacle* linear, broad, taper-pointed, leafy, roughish, dark green. *Flowers* ranged alternately, but solitarily and not in pairs, each on a short stalk. Their form is ovate, or rather elliptical, pointed, by no means orbicular; the larger valve convex, and in our specimen downy; the smaller concave and smooth, with a pair of minute, parallel, close-pressed, reddish, lanceolate scales at its base, which perhaps invalidate the generic character, even more than the shape of the glumes. (See PANICUM.) Whether they are the rudiments of abortive florets we presume not to determine. Our specimen, to which no place of growth is attached, is much more luxuriant than what Bergius has drawn, but has only an upper leaf. The *spikes* are for the most part above two inches long, half-whorled, spreading in every direction. There are none of the bristly hairs about the *stipula*, seen in *P. paniculatum*, nor are there any such hairs below the *spikes*, except a very few minute ones to the lowermost of all. The *stipula* is externally downy.

17. *P. stoloniferum*. Bosc. Tr. of Linn. Soc. v. 2. 83. t. 16. Willd. n. 6. Ait. n. 3. (*P. racemosum*; Jacq. Ic. Rar. t. 302.)—*Spikes* very numerous, crowded, racemose. *Flowers* alternate, elliptical, pointed, transversely corrugated, overtopping the lanceolate pointless receptacle.—Native of Peru, where it is commonly known by the name of *Alzaillo*. We received seeds from Mr. Bosc in 1791, from which plants were raised by Mr. Hoy, in Sion gardens. Sir Joseph Banks sent this species to Kew in 1794, where it is kept in the stove, flowering in July and August. This is a very handsome perennial grass, whose stem is branched, two feet high, leafy, smooth, procumbent at the base, and throwing out roots from the joints. *Leaves* broad, almost ovate at the base, from four to six inches long, acute, smooth, many-ribbed, rough-edged; their *sheaths* close, long, and smooth. *Stipula* short, membranous, without hairs. *Common spike* near a span long, elegantly variegated with purple, green and white; *partial* ones numerous, crowded, scattered or partly whorled, each scarcely an inch long, supported by a short downy stalk. *Receptacle* lanceolate, broad, wavy, rough-edged, green and leafy, without any taper point. *Flowers* from eight or ten to twenty in each spike, alternate, imbricated in two rows, elliptical with a small point; the margins, of the flatter calyx-valve more especially, strongly corrugated and crenate.

18. *P. corymbosum*.—*Spikes* several, alternate, corymbose; the lower ones longest. *Flowers* alternate, nearly orbicular, smooth, almost sessile. *Receptacle* wavy. *Leaves* and *sheaths* hairy.—Gathered by Dr. Afzelius at Sierra Leone. The lower part of the stem is decumbent, and bent at the joints; the rest erect, leafy, about 18 inches high. *Leaves* rather narrow, sharp-pointed, clothed on both sides with soft hairs. The *sheaths* are hairy likewise, especially at the upper part. *Stipula* chiefly composed of long hairs. *Spikes* about five, crowded near together at the top of the stem, alternate, spreading every way; the lowest two inches and a half long, the rest gradually shorter, so that all are about level at the summit. *Receptacle* linear, but rather narrow, wavy, smooth, except at the edge. *Flowers* very numerous, imbricated in two rows, nearly orbicular, smooth, single-ribbed, so gibbous as to be almost hemispherical, on short smooth stalks.

19. *P. orbiculare*. Forst. Prodr. 7. Brown n. 2.—*Spikes* alternate, distinct, bristly at the base. *Flowers* alternate, nearly orbicular, smooth; their outer glume three-

ribbed. *Leaves* flat; thickened and toothed at the margin.—Gathered by Forster in the Society islands; by Mr. Brown in the tropical part of New Holland, as well as near Port Jackson. We have seen no specimen of this or the next.

20. *P. pubescens*. Brown n. 3.—“*Spikes* alternate, distinct, sessile. *Flowers* ovate, downy; their outer glume three-ribbed. *Leaves* flat, hairy, and rough above, thickened and toothed at their margin.”—Gathered by Mr. Brown, in the tropical part of New Holland.

21. *P. littorale*. Brown n. 4.—*Spikes* two or three, alternate, downy at the base. *Flowers* ovate, acute, smooth. *Leaves* involute, naked. *Stem* compressed.—Found by Mr. Brown in the tropical regions of New Holland, as well as near Port Jackson. We have specimens, gathered by Dr. White at the last-mentioned place, which answer to Mr. Brown's definition, except that though in some of them the *spikes* are only two, one elevated above the other, in others they are three, ranged alternately along the angular top of the stem. Each stands on a very short downy stalk. The *receptacle* is leafy, wavy, rather narrow, one inch and a half or two inches long, smooth, except the edges. *Flowers* large, imbricated in two rows, projecting much beyond the receptacle, on short, smooth, compressed stalks.

22. *P. hirsutum*. Retz. Obf. fasc. 2. 7. Willd. n. 8.—*Spikes* about two, alternate. *Flowers* many-nerved, smooth. *Leaves*, *sheaths*, *stem*, and partial flower-stalks hairy.—Sent from China by Bladh. The stems are erect, leafy, hairy in their upper part. *Leaves* flat, ribbed, hairy all over, as well as their *sheaths*, which are bearded at the top. *Spikes* nearly erect, alternate, two only in Retz's specimen, their *receptacles* leafy, narrower than in *P. serobiculatum*. *Flowers* in two rows, alternate, smooth, with three or five ribs, on hairy stalks. Retz.

Willdenow by mistake copies from Retz's *spicis subbinatis*, (placed in pairs) for *subbinis*; an important difference.

23. *P. Kora*. Willd. n. 9, excluding Forster's Syn.—*Spikes* two or three, alternate, hairy at the base. *Flowers* orbicular, smooth, five-ribbed. *Stem* and *leaves* smooth. *Stipula* hairy.—Native of the East Indies. Sent from Tranquebar, by the Rev. Dr. Rottler. The stem is branched, decumbent in the lower part, smooth, as are the leaves and their *sheaths*. *Stipula* membranous, short, accompanied by a few long hairs. *Spikes* two or three, alternate, one and a half or two inches long, of numerous, alternate, crowded, nearly orbicular flowers, half as large as *P. serobiculatum*, on very short partial stalks. *Receptacle* leafy, narrow, straight and even, scarcely zigzag, except its midrib.

24. *P. distichum*. Linn. Sp. Pl. 82. Willd. n. 11. Ait. n. 4. Swartz. Obf. 35. t. 2. f. 1. (Gramen dactylon bicorne repens, foliis latis brevibus; Sloane Jam. v. 1. 112.)—*Spikes* two or three, alternate. *Flowers* ovate, acute, smooth, three-ribbed. *Receptacle* straight. *Leaves* smooth, as well as the stem. *Stipula* hairy.—Native of rather moist grassy pastures in the West Indies. The stem is simple, near two feet high, decumbent at the base, very smooth. *Leaves* flat, according to Swartz; involute when dry, taper-pointed, smooth; with long smooth *sheaths*, crowned with a hairy *stipula*, and not (as Swartz says) hairy at the base. *Spikes* usually two, one above the other, sometimes three, approximated, but really alternate, one inch and a half long, with a linear, even, straight, flat, smooth, rather glaucous *receptacle*. *Flowers* twenty or thirty, alternate, crowded, nearly sessile, ovate, acute, pale, concave on the outside, with three ribs. *Anthers* dark purple. *Stigmas* blue.

25. *P. longiflorum*. Retz. Obf. Fasc. 4. 15. Willd. n. 10.—*Spikes* two, terminal, equal, on short stalks.

Flowers

Flowers ovate, pointed, smooth, three-ribbed. Receptacle zigzag. Root creeping. Stems erect. Leaves smooth. *Stipula* hairy.—Native of the East Indies. Sent from Tranquebar, by the Rev. Dr. Rottler. This has a long creeping root, like *Carex arenaria*, throwing up, like that, many stems, hardly a span high, slender, smooth, leafy, rarely branched. Leaves smooth, narrow, acute, spreading, with long smooth sheaths, crowned with a short *stipula* beset with brittle hairs. Spikes two, an inch long, on a level at the top of the stem, first erect, then divaricated, each on a smooth, short, tapering stalk. Receptacle zigzag, smooth, with a zigzag furrow. Flowers ten or twenty, situated and shaped nearly as in the last, but rather more elongated and more pointed, slightly convex rather than concave at the back. Willdenow says it has sometimes three spikes, but he neglects to inform us how they are, in that case, situated. We have never seen more than two, always on stalks of equal length, springing from one point, which is not the case with the *distichum*.—The habit and aspect of this grass resemble *Panicum Daëylon*; and it appears destined, like that, to grow in loose blowing sand, which the many-branched fibres of its roots are calculated to bind together and to fix, thus performing a very important service in the economy of nature.

26. *P. vaginatum*. Swartz Ind. Occ. v. 1. 135. Willd. n. 13.—Spikes two, terminal, equal, on short stalks. Flowers ovate, pointed, smooth. Receptacle somewhat zigzag. Stem creeping, bent at the joints, branched. *Stipula* hairy.—Native of pastures, on a clay soil, in Jamaica. Swartz. By his description, which is our only source of information concerning this species, it comes very near the last in technical characters, except that it does not seem to have the same long creeping roots, and numerous, mostly simple, stems. He describes the roots as numerous and thread-shaped. Stem a foot high, creeping, bent at the joints, and subdivided. Leaves nearly linear, acute, spreading, with broad, compressed, two-ranked, striated, smooth sheaths, crowned with hairs. Spikes an inch long, spreading. The rest of his description we have compared with the last, in order to compile a specific character. Had we specimens of both, more differences might appear.

27. *P. filiforme*. Swartz. *ibid.* 136. Willd. n. 14.—Spike mostly solitary, linear, very slender. Flowers very numerous, on short stalks, elliptical, three-ribbed. Leaves brittle-shaped, channelled. Common in dry open fields in the West Indies. Communicated by Dr. Swartz. This species is known from all the rest by its extremely slender habit. It is two feet high, and grows in tufts. The stem is quite smooth, almost capillary, but rigid and erect. Leaves long, straight, almost equally slender; convex and smooth beneath; channelled above; with long close sheaths, hairy at the top. Spike two or three inches long, with a very narrow, slightly zigzag receptacle, covered on one side with a double row of closely imbricated, small, smooth, elliptical flowers. Anthers yellow. Stigmas bluish.

28. *P. decumbens*. Swartz. *ibid.* 138. Willd. n. 13.—Spikes solitary, on long, capillary, solitary or aggregate stalks. Flowers nearly orbicular, pointed. Leaves ovato-lanceolate, hairy.—Gathered in dry sandy mountainous situations, on the west side of Jamaica, by Dr. Swartz, to whom we are obliged for specimens. The stems are procumbent, about a foot long, branched, leafy, slender, smooth, bent at the joints, apparently compressed, though described as cylindrical. Leaves rather broad, lanceolate, acute, ovate at the base, clothed, more or less, on both sides, with soft scattered hairs; with slightly tumid sheaths, about their own length, whose edges are thickly

fringed. *Stipula* short, membranous, jagged, hairy. Flower-stalks from one to five, from the sheaths of some of the upper leaves, rather shorter than the leaf, capillary, loosely spreading, simple, angular, downy. Spikes solitary, hardly an inch long, drooping. Flowers from sixteen to twenty, loosely imbricated, in two rows, on short stalks, slightly obovate, or very nearly orbicular, quite smooth; convex and almost hemispherical, with slight furrows, on one side; quite flat, even, and ribless on the other. This flat side is accompanied at the base with a small abrupt scale, or imperfect glume, like what Mr. Brown mentions in *P. orbiculare*; see observations after the generic character; which appears to us to bring the present species very near indeed to *Panicum*. The receptacle is narrow and convex, smooth, except at the base, by no means of the leafy dilated form usual in *Paspalum*.

We have thus added thirteen species to the fifteen in Willdenow, nor are we without suspicion of some more, which we have not sufficient materials to determine. There can be no doubt, that the greater part of the described species constitute a natural genus, which ought to be kept distinct from *Panicum*, whatever may become of some ambiguous ones; especially as *Panicum* itself is so overloaded with species already, and so difficult, in many cases, to define.

It is remarkable that no *Paspalum* has been found in Europe, though the species of *Panicum* are scattered all over the world. S.

PASPARDO, in *Geography*, a town of Italy, in the department of the Adda and Oglio; 4 miles N. of Breno.

PASPAYA, a town of South America, in the viceroyalty of Buenos Ayres; 60 miles S. of La Plata.

PASQUA, a town of Mexico, in the province of Xalisco, situated at the mouth of a river, which runs into the Pacific ocean; 45 miles W.N.W. of La Purification. N. lat. 20° 5'.

PASQUALI, SIGNOR, in *Biography*, an excellent performer on the violin, and a good musician, who came to England about the year 1743, went to Edinburgh in 1752, where he had an establishment, and lived much respected as a professor, and beloved as a man by all who knew him, till the time of his death in 1757. The following is extracted from the Edinburgh Caledonian Mercury of Saturday, Oct. 15th, 1757.

“Thursday, October 13th, 1757. Died at Edinburgh signior Pasquali, master of music in this city, a person eminent in his profession as a composer, performer, and teacher. He joined to a singular probity of manners, good sense, and knowledge of mankind, free from the smallest tincture of caprice. One qualification most remarkable in him was, that although he did the greatest justice as a teacher, yet he acted in his profession more from a real *delight in music*, and regard to fame, than profit or gain. Under his conduct, the spirit of this branch of the fine arts has diffused itself through all ranks, and is now carried to a degree never before known in this kingdom. Signior Pasquali's death is a public loss to this city, that will not soon be supplied.”

PASQUILINI, SIGNOR, an Italian performer on the violoncello, who arrived in England about the year 1747, and remained here till the time of his death, about 1756. He had great knowledge of the finger-board, and his execution was very neat; but his tone was thin, crude, and uninteresting. After the death of Caposale, he was the principal performer on the violoncello at the opera, at Ranelagh, and at all the great concerts. He was a good musician, and performed correctly the part assigned him; but without effect. In Dublin, when he had played half his solo, the

steward

steward of the concert for the night, not knowing that his tone was always the same, or perhaps not knowing one tone from another, went up to him, crying out with some degree of impatience, "Come, come, Pasquali, don't be flourishing all night, but begin your solo!"

PASQUARO, or UTZILA PASQUARO, in *Geography*, a town of Mexico, and present capital of Mechoacan, on the S. side of a large lake abounding in fish. The population consists of 500 families of Spaniards and Mulattoes, and 2000 families of Indians, chiefly employed in sugar-mills, and neighbouring copper-mines; 120 miles W. of Mexico. N. lat. 19° 50'.

PASQUE-FLOWER, in *Gardening*, the common name of a well-known flower. See ANEMONE.

PASQUETANK, in *Geography*, a county of North Carolina, in the district of Edenton, N. of Albemarle sound, containing 5037 inhabitants, including 1593 slaves.—Also, a small river of North Carolina, which rises in the Great Dismal Swamp, and, passing by Hertford, falls into Albemarle sound.

PASQUIER, STEPHEN, in *Biography*, a celebrated lawyer and man of letters, was born at Paris in 1528. Having been educated for the bar, he was, at a proper time, admitted an advocate in the parliament of Paris, and became distinguished as one of the most eloquent pleaders of his time, as he really was one of the most learned men of the age. He shone particularly in the causes which he pleaded against the Jesuits, who, he contended, ought not only to be excluded from the university, but banished wholly from the kingdom. He was at all times a zealous friend to the royal authority, and was rewarded by Henry III. with the post of advocate-general of the chamber of accounts, which he exercised with great credit, and transmitted to his eldest son. He died in 1615, at the great age of 87. He had been thrice married, the first time, as he says, in a Latin epigram, for enjoyment, the second for the sake of money, and the third for help. He was a considerable writer in verse and prose. His poems are in Latin and French; the former are reckoned by much the best. The most important of Pasquier's works is entitled "Recherches sur la France," of which he published seven books, and three more were given from his papers after his decease. The best edition of it is that of 1665. His letters, in five volumes, are full of curious anecdotes and remarks. His "Catechisme des Jesuites" is a very severe attack upon the founders and principles of that order. His second son Nicholas, a matter of requests, left a volume of letters abounding with historical anecdotes. Moreri.

PASQUIN, a mutilated statue, seen at Rome, in a corner of the palace of the Ursini. It takes its name from a cobbler of that city, called Pasquin, famous for his sneers and gibes; and whose shop was the resort of a number of idle people, who diverted themselves with bantering folks as they passed by.

After Pasquin's death, as they were digging up the pavement before his shop, they found a statue of an ancient gladiator, well cut, but maimed, and half spoiled. This they set up, in the place where it was found, at the corner of the deceased Pasquin's shop; and, by common consent, called it by the name of the defunct.

From that time all satires and lampoons are ascribed to this figure, and are put in its mouth, or pasted against it; as if they came from *Pasquin redivivus*. Pasquin usually addresses himself to Marforio, another statue in Rome; or Marforio to Pasquin, whom they then make reply.

The answers are usually very short, poignant, and unlucky. When Marforio is attacked, Pasquin comes to his

assistance; and Pasquin is assisted by Marforio in his turn; *i. e.* the people make the statues speak just what they please.

PASQUINADE, or PASQUIL, is properly a satirical libel, fastened to the statue of Pasquin.

Hence, by extension, the term becomes used for any satire, lampoon, or sneer upon the public, or upon the ruling powers.

There is this difference between a *pasquinade* and a *satire*; that the end of the latter is to correct and reform; whereas that of the former is only to scoff and expose.

The Italians have published several books which they call *Pasquino in estasi*, *Pasquin in an ecstasy*.

PASQUINO, ERCOLE, in *Biography*, a great organ-player at Rome, began to flourish about the year 1620, and his son, Bernardo Pasquino, the master of Gasparini, about 1672. This last was contemporary with Corelli, and frequently played in the same orchestra with him at the opera in Rome. See Paral. des Fran. et des Ital.

PASS, in *Military Language*, a straight, narrow and difficult passage, which shuts up the entrance into a country.—Also, a voucher for the absence of a non-commissioned officer or soldier.

PASS, *To*, is to march by open order of columns, for the purpose of saluting a reviewing general. Each division or company, on its march, will open its ranks at the distance of 50 paces from the general, and again close them, after it has passed thirty paces. The whole march in ordinary time, till the leading division arrives at the spot where the left of the battalion originally stood. The commanding officer then halts the regiment, the music ceases to play, and the different divisions which supported arms march in quick time until they have completed the third wheel from the ground of original formation, when arms are ordered to be carried, the music plays, and as each division completes the third wheel, the officers shift to the right, and the whole pass the general.

PASS, *All's well*, a term used by a British sentry, after he has challenged a person that comes near his post, and has given him the proper parole, watchword, or countersign.

PASS-Parole, a command or word, which is given out at the head of an army, and from thence passed from mouth to mouth, till it reach the rear.

PASS. See PASSPORT.

PASS, *Passade*, in *Fencing*, a leap, or advance upon the enemy.

Of these are several kinds; as *voluntary passes*, commencing from the left foot out of measure of the firm foot; as when the enemy is not expected.

Others, *necessary*, made after a push from the right foot; where, being to pressed by the enemy as not to have time to retire, you endeavour to seize the guard of his sword.

The measure of the pass is, when the two smalls of the swords are so near, that they may touch one another.

There are passes within, above, beneath, to the right, the left; and passes under the sword, over the line, &c.

PASS, among *Miners*, a frame of boards consisting of two or three bottom boards, and two side ones, set slopewise; through which the ore slides down into the coffer of the stamping-mill.

PASS of *Arms*, in *Chivalry*, a place which the ancient knights undertook to defend, *e. gr.* a bridge, road, &c. which was not to be passed without fighting the person who kept it.

The knights who held the pass, hung up their arms on trees, pales, columns, &c. erected for the purpose; and such as were disposed to dispute the pass, touched one of these

these armories with his sword, which was a challenge the other was obliged to accept. The vanquished gave the victor such prize as was before agreed on.

PASS-Guards, in *Ancient Tilting Armour*, were plates fixed on each shoulder, declining from the face like wings, which were intended to protect the eyes from the point of the lance: the left side of the face, the left shoulder and breast were covered by a plate called *grand-guard*.

PASSA, Uva Passu, in *Pharmacy*, a term applied to those dried grapes, which we call raisins.

Uve PASSÆ is sometimes also used, with less propriety, for figs.

PASSACAGLIO, a slow dance, resembling the chaconne; the only difference is, that it is generally somewhat slower, and more pathetic: on this account, the *passacaglii* are almost always composed in the minor keys. Brossard.

PASSACAILLE, Fr. Rousseau gives nearly the same definition; adding, that the *passacaille* of "Armida" and "d'Ifé" are famous in the operas of Lulli and Mondonville.

PASSADE, or *PASSADO*, in *Fencing*, a thrust or pass.

PASSADE is also a benevolence or alms given to poor passengers.

PASSADE, in the *Manege*, signifies a turn or course of a horse backwards or forwards on the same plot of ground, passing or repassing from one end to the other.

This cannot be performed without changing the hand, or turning and making a demi-tour at each of the extremities of the ground. Hence it is, that there are several sorts of *passades*, according to the different ways of turning, in order to part or put again, and return upon the same piste, or tread; which we call closing the *passade*.

The *passades* are the truest proofs a horse can give of his goodness. By his going off, you judge of his swiftness; by his stops, you discover the goodness or imperfection of his mouth; and by the readiness with which he turns, you are enabled to decide upon his address or grace.

A *passade of five times*, or a demivolt of five times, is a demitour made at the end of the straight line, one hip in, in five times of a gallop upon the haunches; and, at the fifth time, he ought to have closed the demivolt, and to present upon the *passade* line straight and ready to return. The demivolts of five times or periods are the most common airs of changing the hand, or turning, that are now practised.

A *perfect passade* is made in this manner: your horse standing straight and true upon all his feet, you go off with him at once, you stop him upon his haunches, and in the same time or cadence in which he made his stop, being exactly obedient to the hand and heels, he ought to make the demivolt, balancing himself upon his haunches, and so waiting, till you give him the aid to set off again. In this case it is necessary, that the least motion or hint of the rider should be an absolute command to the horse. If you would have him go off at full speed, yield your hand, and close the calves of your legs upon him: if he does not answer to this aid, give him the spurs, in such a manner as not to remove them from the place where they were, and without opening or advancing your legs before you strike.

Raised, or high passades, are those which a horse makes, when, being at the end of his line, he makes his demivolt in any air he has been taught, either in the mezoir, or in curvets. In high *passades*, let your horse go off at full speed; let your stop be followed by three curvets; let the demivolt consist of the same number, and demand of him three more before he sets off again. It is usual to make nine curvets, when you work a horse alone.

VOL. XXVI.

Furious, or violent passades, are when a horse gallops at his utmost speed straight forward, and makes his half stop, bending, and playing his haunches two or three times before he begins his demivolt, which is made upon one line in three times; for at the third time he should finish the demivolt, and be straight upon the line of the *passade*, in order to go off again and continue it. This kind of *passade* was formerly used in private combats.

Passade of one time, is a demivolt or turn, made by the horse, in one time, of his shoulders and haunches.

In all *passades* the horse should, in making the demivolt, gather and bring in his body, making his haunches accompany his shoulders, without falling back, or not going forward enough each time; and he should go in a straight line, without traversing or turning his croupe out of the line. Berenger's Horsemanship, vol. ii. chap. 15.

PASSADUNKEAG, in *Geography*, a considerable branch of Penobscot river, meandering through four townships, and affording a route by which the Indians have an inland communication with the Schooduck lakes, and other waters which flow into Passamaquoddy bay by a short portage.

PASSAGE, in *Sea Language*, denotes a voyage from one place to another by sea; an outward or homeward bound voyage.

PASSAGE Boat, a boat to carry passengers and luggage from one place to another by water.

PASSAGE, in *Commerce*, or *Right of Passage*, is an imposition, which some princes exact by their officers or farmers, in certain narrow close places of their territories, either by land or sea, on all vessels, vehicles, and carriages of all kinds; and even sometimes on persons as passengers coming in or going out of ports, &c.

The passage of the Sound (that famous streight, which carries us out of the German into the Baltic sea,) is the most celebrated passage in Europe. The dues thereof belong to the king of Denmark, and are paid at Elsinore or Cronenburg.

PASSAGE, in the *Manege*, an action, in which the horse raises two legs together, a hind and a fore-leg, in form of St. Andrew's cross; when setting those two on the ground again, he raises the other two; and thus alternately, never gaining above a foot of ground at a time.

The beauty of the passage consists in keeping the legs a good while in the air: setting that aside, the motion of the legs in the passage is the same as in pacing and trotting.

As the passage is the key which opens to us all the justness of the art of riding, and is the only means of adjusting and regulating horses in all sorts of airs, it is necessary to observe, that there are many kinds of it. In that which is derived from the trot, the action of the horse's legs is the same as in the trot; and this passage is distinguished from the trot, merely by the extreme union of the horse, and by his keeping his legs longer in the air, and lifting them both equally high, and being neither so quick nor violent as in the action of the trot. In the passage which is founded on the walk, the action of the horse is the same as in the trot, with this difference, that he lifts his fore-feet a good deal higher than his hinder; that he makes a certain time or interval sufficiently long between the motion of each leg; his action being much more together and shortened, more distinct and slow than the ordinary walk, and not so extended as in the trot, so that he is, as it were, kept together and supported upon himself. There is another sort of passage, to which the trot likewise gives birth, and in which the action is so quick, so diligent, and so supported, that the horse seems

not to advance, but to work upon the same spot of ground. No horse should be put to passage till he has been well trotted out, is supple, and has acquired some knowledge of the *union*, which see. Berenger's Horsemanship, vol. ii. chap. 10.

To passage a horse upon his own length, see LENGTH.

PASSAGE, *Passo*, Ital. in *Music*, as in literature, is a single period, or sentence, selected for praise, censure, or illustration. But in France, according to Rousseau, it is a flourish, or division in gracing a particular bar, or trait of melody. But in Italy, fingers are obliged to know how to invent passages extemporaneously upon any given notes; whereas in France, and, we fear, in England, young fingers dare not hazard a single passage that has not previously been written down and practised.

PASSAGE, *Birds of*, in *Ornithology*, are such as only come to us at certain seasons, and then disappear again; being supposed to pass the sea to some other climate.

Among the birds of passage are the stork, swallow, nightingale, martin, woodcock, quail, hooded crow, cuckoo, wry-neck, several species of the pigeon and thrush, snipe, curlew, several species of sand-piper, long-legged plover, land-rail, several species of grebe, divers, terns, mergansers, many species of ducks, &c.

Mr. Pennant remarks, that every species of the genera of curlews, woodcocks, sand-pipers, and plovers, that forsake us in the spring, retire to Sweden, Poland, Prussia, Norway, and Lapland, to breed; and as soon as the young can fly, they return to us again; because the frosts which set in early in those countries, deprive them of the means of subsistence; and the dryness and hardness of the ground, in general, during our summer, prevent them from penetrating the earth with their bills in search of worms, which are the natural food of these birds. Of the numerous species of migrating fowl, there are scarcely any that may not be traced to Lapland, a country of lakes, rivers, swamps, and alps, covered with thick and gloomy forests, that afford shelter during summer to these fowls, which in winter disperse over the greatest part of Europe. In those northern regions, by reason of the thickness of the woods, the ground remains moist and penetrable by the woodcocks, and other slender-billed fowl; and for the web-footed birds, the waters afford larvæ with numbers of the gnat. The days are long, and the light nights are favourable to their collecting this food; to which we may add, that mankind are very sparingly scattered over that vast northern waste. *British Zoology*, vol. ii. Appendix. See MIGRATION.

Beside the migratory birds, which live in different countries a whole winter, or a whole summer, there are some others which annually appear in particular places, at the time of the ripening of particular kinds of grain which their own country is destitute of; and these depart after a short stay, and are no more seen till that time the following year. Of this kind are the rice-bird, and blue-wing of Carolina. Birds, like men, pursue their searches after food, or whatever else is necessary and agreeable, through distant climes; and, when they discover some new grain, or pleasing food, they return and acquaint their community of the good fortune; and then, joining in numerous flights, make annual excursions to solace themselves on this exotic food.

Since the discovery of America, there have been introduced from Europe several sorts of grain which were before unknown there, and which, not before some length of time, were found out, and covered by birds of this migratory kind. Of this sort there is a very beautiful species, which has very lately made its first appearance in Virginia; these arrive annually at the time that the wheat is ripe, or nearly

so; and constantly, since they found it out, have appeared in great droves every year, at the season of its ripening; the inhabitants call them, for this reason, *wheat-birds*. Phil. Trans. N^o 483.

There are also fishes of passage, as herrings, mackerel, &c. See FISHERY.

PASSAGE, in *Geography*, a town of South America, in the government of Tucuman, on a river of the same name; 116 miles N. of St. Miguel de Tucuman.

PASSAGE Canal, an inlet in Prince William's sound. N. lat. 60° 48'. E. long. 212° 15'.

PASSAGE Fort, a small town of Jamaica, in the road between Port Royal and Spanish Town; 7 miles S.E. of the latter, and at the mouth of the river Cobre, where it has a fort, with ten or twelve guns. Its trade is brisk, and it contains about 400 houses, most of them being houses of entertainment.

PASSAGE Island, a small island at the entrance of a channel from the North Pacific ocean, among the Philippine islands, about 20 miles E. from the island of Leyta. N. lat. 10° 44'. E. long. 125° 27'.—Also, a small low island in the gulf of Georgia, at the entrance into Howe's sound. N. lat. 49° 21'. E. long. 237° 3'.

PASSAGE Islands, two small islands among the Virgin islands in the West Indies, near the coast of Porto Rico.

PASSAGE, Great, one of the Virgin islands in the West Indies, about seven miles long and two wide; 12 miles E. of Porto Rico.

PASSAGE, Little, one of the Virgin islands, near the former.

PASSAGES, Los, a sea-port town of Spain, in Guipuscoa, with a good harbour, sheltered by mountains, with depth of water sufficient for a 50-gun ship. This is one of the largest and safest harbours in Europe; 3 miles E. of St. Sebastian. N. lat. 43° 10'. W. long. 2°.

PASSAGE Point, a cape on the coast of Patagonia, in the straits of Magellan. S. lat. 53° 15'. W. long. 73° 40'.

PASSAGE Rocks, two rocks in Prince William's sound, one north, about 2½ miles N.N.W. from the north point of the entrance into port Chalmers, Montague's island, and the other south, half a mile W. from the same point.

PASSAGERS. See ALBIGENSES.

PASSAGIO, in the *Italian Music*. See PASSAGE.

PASSAGO, in the *Glass Trade*, the instrument with which the workman makes the bowl of the drinking-glasses, or other the like vessels.

PASSAIC, in *Geography*, a river of America, which rises in a large swamp, in Morris county, New Jersey, and pursues its course from W.N.W. to E.S.E. until it unites with the Hackinoc at the head of Newark bay, N. lat. 40° 43'. W. long. 74° 8'. The cataract, or Great Falls, in this river, is one of the principal natural curiosities in the state. The river is about 40 yards wide, and moves with a gentle current till it approaches a deep cleft in a rock which crosses the channel, and then falls above 70 feet perpendicularly, presenting a most beautiful, though tremendous, scene. The new manufacturing town of Patterson is erected on the Great Falls of this river, and its banks are adorned with many elegant country seats. It abounds with various kinds of fish. A bridge, 500 feet in length, crosses this river on the post-road from Philadelphia to New York.

PASSAIS, a town of France, in the department of the Orne, and chief place of a canton, in the district of Domfront; 6 miles S.W. from Domfront. The place contains 2224, and the canton 14,556 inhabitants, on a territory of 170 kilometres, in 9 communes.

PASSA-

PASSALORHYNCHITES, *PASSALORHYNCHITÆ*, in *Eccl:astical History*, a sect of Montanists in the second century, who made profession of perpetual silence, and, the better to maintain it, kept the thumb continually upon the lips; founding their practice on that of the Psalmist, *Set a guard, O Lord, on my mouth*.

St. Jerom mentions his having met with some of them in his time.

PASSAMAN, in *Geography*, a town on the W. coast of the island of Sumatra, near the equator.

PASSAMAQUODDIES, a tribe of Indians, who inhabited the vicinity of Passamaquoddy bay.

PASSAMAQUODDY, a town and river of America, near which is the division line between the British province of New Brunswick and the United States. The island of Camoo Bello in the North Atlantic ocean, is at the middle or W. passage of the bay, in N. lat. $44^{\circ} 50'$, and W. long. $66^{\circ} 46'$. The distance from Crofs isle, Machias, to W. Passamaquoddy head, is nine leagues N.E. by E.; and from the head over the bar to Allen's isle N.N.W. two leagues. Three rivers fall into the bay; the largest of which is called by the Indians the Scoodich, but by De Moins and Champlaine, Etchemina. Its main source is near Penobscot river, and the carrying place between the two rivers is only three miles.

PASSAMEZZO, from *passer*, to walk, and *mezzo*, the middle, in *Musie*, is a slow dance, differing little from the action of walking. As a galliard consists of five paces, or bars, in the first strain, and is, therefore, called a cinque pace, the passamezzo, which is a diminutive of the galliard, has just half that number, and from that peculiarity takes its name.

PASSANGAN, in *Geography*, a town on the N. coast of the island of Sumatra. N. lat. $4^{\circ} 45'$. E. long. $97^{\circ} 2'$.

PASSANT, in *Heraldry*, a term applied to an animal in a shield, appearing to walk leisurely; or, to the ordinary posture of terrestrial animals.

Thus we say, he bears gules two lions *passant*, in pale. For most beasts, except lions, they frequently use the word *tripping* instead of *passant*.

PASSARA, in *Geography*, a town on the W. coast of the island of Borneo; 80 miles S.W. of Borneo.

PASSARADO, or PASSAREE, in a *Ship*, is a rope whereby all the sheet-blocks of the main and fore-sails are hauled down; the clew of the main-sail to the cubbridge-head of the main-mast, and the clew of the fore-sail to the cat-head. This is to be done when the ship goes large; and they are also kept firm down, and hindered from flying up, by this passarado rope.

PASSARGA, in *Geography*, a river of Prussia, which runs into the Frisch Haff, N. lat. $54^{\circ} 23'$. E. long. $19^{\circ} 42'$.

PASSARGOS, Los, a small island in the Grecian Archipelago, between the coast of Natolia and the island of Scio. N. lat. $38^{\circ} 17'$. E. long. $26^{\circ} 14'$.

PASSARO, a town of Sicily, in the valley of Noto; 30 miles S. of Syracuse.

PASSARON, a town of the Morea; 18 miles S. of Argos.

PASSAROWITZ, a town of European Turkey, in Servia, near the river Morava; 33 miles E.S.E. of Belgrade.

PASSARUAN, PASSAROWAN, *Passorouang*, or *Pasfourwang*, a town of the island of Java, and capital of a kingdom, situated on the N. coast; the chief trade of which consists in cotton. The houses are neatly built, and the country appears to be well cultivated. The pro-

duce of this settlement is rice, of which they export large quantities. The Dutch here are few; the Javanese are numerous, and their chief lives with considerable splendour. They have good roads, and posts are established along the coast; and it appears to be a busy and well-regulated settlement. S. lat. $7^{\circ} 36'$. Stavorinus's *Voyage*, vol. ii.

PASSAU, a city of Germany, in the circle of Bavaria, and capital of a bishopric and principality of the same name, situated on the Danube, where it receives the Inn and the Ilz. It consists of three towns, viz. Passau properly so called, betwixt the Danube and the Inn, Innstadt, and Ilzstadt. The city, where it is surrounded by water, is without the walls, but towards the land side of Bavaria is fortified with ramparts and ditches. Passau is well situated for trade. It remained under the power of the Romans till it was taken by the Alemanni in the year 475. After its fall under the dominion of the Franks, it continued subject to the dukes of Bavaria. In 999, it was made subject to the bishop by the emperor Otho III. In 1552, the religious peace, usually denominated "The treaty of Passau," was concluded here. In 1802, part of the bishopric beyond Iltz and the Inn, towards Austria, was given to the grand duke of Tuscany; 82 miles E.N.E. of Munich. N. lat. $48^{\circ} 34'$. E. long. 13° .

The famous treaty of "pacification" with the Protestants was concluded at Passau, soon after the advantage gained by Maurice of Saxony against the emperor Charles in the year 1552: the emperor also promising to assemble, within six months, a diet, in which all the tumults and dissensions that had been occasioned by a diversity of sentiments in religious matters should be removed. (See AUGSBURG.) As this treaty is considered by the German Protestants as the basis of their liberty, it may not be improper to insert here some of its principal articles.

By the three first articles it was stipulated that Maurice and the confederates should lay down their arms, and should lend their troops to Ferdinand to defend Germany against the Turks, and that the landgrave of Hesse should be set at liberty. By the fourth, it was agreed that the rule of faith, called "Interim," should be considered as null and void; that the contending parties should enjoy the free and undisturbed exercise of their religion, and a diet should be assembled to determine amicably the present disputes: and that this religious liberty should continue always, if it should be found impossible to come to an uniformity in doctrine and worship. It was also resolved, that all those who had suffered banishment, or any other calamity, on account of their having been concerned in the league or war of Smalcalde, should be re-instated in their privileges, possessions, and employments; that the imperial chamber of Spire shall be open to the Protestants as well as to the Catholics; and that there should be always a certain number of the Lutheran persuasion in that high court.

PASSAWAY, a town of Hindoostan, in the circar of Jyenagur; 30 miles E. of Parasaoli.

PASSE-BLEU, in *Ornithology*. See TANAGRA *Cerulea*.

PASSE-HENDAELE, in *Geography*, a town of France, in the department of the Lys, and chief place of a canton, in the district of Ypres. The place contains 2664, and the canton 14,117 inhabitants, on a territory of 110 kilometres, in 5 communes.

PASSEMANT, CLAUDE SIMEON, in *Biography*, an able French optician and mathematical instrument-maker, was born at Paris in the year 1702. He had little more than his industry to depend on, and for some time he wrote in an attorney's office: after this he entered himself as a

clerk or shopman to a woollen-draper, and then carried on the business of a haberdasher on his own account. Being married, he committed the care of his shop to his wife, and directed his own attention to the study of natural philosophy, optics, and astronomy, which he had cultivated from his youth at leisure hours. He devoted likewise much of his time to the construction and improvement of mathematical instruments, for which he seems to have had a decided mechanical turn. In 1738, he published "A Treatise on the Construction of Reflecting Telescopes." Some time after this, he published "The Description and Use of Telescopes, Microscopes, &c." of his own invention. He constructed an astronomical pendulum, crowned with a moving sphere, which was made to represent the revolutions of the planets, in a manner that exactly corresponded with the astronomical tables. He presented this machine to Lewis XV. and it was formerly to be seen in the royal apartments at Versailles. He made a similar instrument for the Turkish emperor, which shewed the rising and setting of the sun and moon. He furnished the king and other great men in France with sets of instruments for making experiments in optics, and other branches of science. He died suddenly in 1769, respected as well for his integrity and amiable character, as for his talents and acquirements.

PASSENHEIM, in *Geography*, a town of Prussia, in the province of Oberland; 70 miles S. of Königsberg.

PASSE-PIED, a dance, though of the same measure as the minuet, except that it admits of no binding-notes, and begins with an odd quaver. Indeed it more resembles the courant than the minuet.

PASSER, in *Geography*, a river of the Tyrol, which runs into the Adige, near Meran.

PASSER, in *Ichthyology*. See PLEURONECTES.

PASSER *Aquaticus*, in *Ornithology*. See *Water Sparrow*.

PASSER *Arundinaceus*, & *arundinaceus torquatus*, the reed sparrow. See *EMBERIZA Schoeniclus*.

PASSER *Asper*, in *Ichthyology*. See *DAB*.

PASSER *Britannicus*, a name given by Charleton to the foal-fish, and by some others to the turbot. See PLEURONECTES.

PASSER *Canadensis*, or *Canarius*, in *Ornithology*. See *CANARY-BIRD*.

PASSER *Domeslicus*. See *FRINGILLA Domeslica*.

PASSER *Faber*, a name given by Nieremberg to a bird, the genus of which is not certainly known; it being also called *turdus chiappæ*. It is remarkable for perforating the bark of the pines, and lodging its acorns there, which it afterwards occasionally eats.

PASSER *Fluviatilis*, in *Ichthyology*. See *FLOUNDER*.

PASSER *Indicus*, *macrourus alius* of Aldrovand, or the other long-tailed Indian sparrow, in *Ornithology*, is a very beautiful bird, with a blue beak, and a black head; the body being mostly of a fine scarlet. See *EMBERIZA Paradisea*. See also *TANAGRA Brasilia*.

PASSER *Muscatus*, a name by which some have called the *juviumbi*, or humming-bird. See *TROCHILUS Colubris*.

PASSER *Niger*. See *FRINGILLA Nottis*.

PASSER *Rubi*. See *MOTACILLA Modularis*.

PASSER *Solitarius*, the solitary sparrow. See *TURDUS Solitarius*.

PASSER *Stultus*, a name given by Nieremberg to the noddy, a species of the *Sterna*, so tame and foolish, that it will stand still for any one to lay his hand upon it. See *STERNA Stolidus*.

PASSER *Troglodytes*, the name by which authors call the wren. See *MOTACILLA Troglodytes*.

PASSERAT, JOHN, in *Biography*, an ancient French

poet and man of letters, was born, in 1534, at Troyes, in Champagne. After studying law at Bourges under the celebrated Cujas, he went to Paris, and taught the belles lettres in the colleges of the university. In 1572 he succeeded Peter Ramus as professor-royal of eloquence. His lectures were extremely well attended by persons of rank and consideration, and he was warmly patronized by Charles IX. and Henry III. The disorders and contests occasioned by the League obliged him to shut up his school, till the entry of Henry IV. into Paris in 1594. Being at Epernay when that place was besieged by the prince of Condé, who threatened to put the inhabitants to the sword, he was deputed by them to intercede with the prince in their behalf, who pardoned them at his request. He had the misfortune to lose an eye by the stroke of a tennis-ball, and this accident aggravated the naturally severe and gloomy expression of his countenance, but he was perfectly amiable in his temper, and free in his conversation. He was too much attached to his studies, and often passed days together without a regular meal. Excess of application was thought to have excited paralytic affections, which put an end to his life in 1602, at the age of sixty-eight. He is principally known by his Latin and French verses. The Latin are chiefly distinguished by their purity and facility, and by the elegant turn which he gives to common thoughts. As a French poet his metamorphosis of a man into a bird is particularly admired, and served, it is said, as a model to La Fontaine in his tales. Passerat is still regarded by some critics as one of the most agreeable of the French poets. He was author of many pieces, of which may be mentioned "Commentaries on Catullus, Tibullus, and Propertius," and a "Translation of the Bibliotheca of Apollodorus." Moreri.

PASSERES, in *Ornithology*, the sixth order of birds according to the Linnæan system, are distinguished by a conical and pointed bill; the nostrils are oval, pervious, and naked; the legs are formed for hopping; the toes are slender, and divided; the bodies of those that feed on grain are pure, but of those that feed on insects impure; the nest is formed with much art. They live chiefly in trees and hedges, are monogamous, and feed the young by thrusting the food down their throats. This order includes all the singing birds; the males are the songsters. They are divided into four sections, as follow:

The genera in section A have thick bills, and are

Colius,	Loxia,
Emberiza,	Phytotoma.
Fringilla,	

The genera in section B have the upper mandible somewhat hooked at the point; these are

Caprimulgus,	Hirundo.
Pipra,	

The genera in C have the upper mandible notched near the end, as in the

Ampelis,	Tanagra,
Muscicapa,	Turdus.

The genera in D have the bill straight, simple, and tapering, as in the

Alauda,	Parus,
Columba,	Sturnus.
Motacilla,	

PASSERG, in *Geography*, a town of Prussia, in the province of Natangen, in the Frisch Haff; 22 miles S.W. of Brandenburg.

PASSERI, GIAMBATISTA, in *Biography*, a celebrated antiquarian, was born at Farnese in 1694. He was destined to the profession of the law, but his inclination led him to

the study of antiquities, which he pursued with assiduity during a four years' residence at Rome. Returning thence to Todi, he collected the monuments of antiquity in that place and its vicinity. In 1726, he turned his attention to Etruscan antiquities, and collected a great number of lamps, and other things, which he arranged in classes. In 1738, having lost his wife, he entered into the ecclesiastical order, and obtained the office of vicar-general of Pefaro. This he exercised many years with zeal and fidelity. He was killed by a fall from his carriage in the year 1780, as he was returning from his country house. He was author of a great number of works, among which are the following: "Lucernæ fistiles Mussæi Passerii," three volumes, being a description of the earthen lamps in his collection; "Picturæ Etruscorum in Vasculis, in unum collectæ, Dissertationibus illustratæ," in three volumes: "Dissertationes on the ancient Monuments in the Musæum Clementinum." When he died, the first volume of an extensive work of his was printing at Rome, entitled, "Thesaurus Gemmarum Selectissimarum."

PASSERINA, in *Botany*, from *passer*, a sparrow, a name which has been applied to some plants, on account of the resemblance of their leaves to the tongue of a small bird. Such at least is its application with respect to *Lysimachia Linum-stellatum*, *Linum striatum*, and *Stellera Passerina*. But Linnæus, who has chosen this appellation for the genus that now bears it, cites Pukenet for saying it is so called because the fruit represents the head of a little bird with its beak; see Linn. Hort. Cliff. 146. The resemblance is not very striking, but the name is preferable to that given by Clusius to the same genus, *Sanamunda*, supposed to be derived from *fano*, to heal, and *munda*, clean; though he adopted it from the Moors of Granada, who were accustomed to use some of this tribe as a purge. Linn. Gen. 193. Schreb. 261. Willd. Sp. Pl. v. 2. 429. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 414. Juss. 77. Lamarck Illustr. t. 291. Class and order, *Oëandria Monogynia*. Nat. Ord. *Veprucule*, Linn. *Thymelææ* Juss.

Gen. Ch. Cal. Perianth of one leaf withering, externally rude, internally coloured; tube cylindrical, slender, tumid below the middle; limb spreading, in four deep, concave, ovate, obtuse segments. Cor. none. Stam. Filaments eight, bristle-shaped, the length of the limb, inserted into the top of the tube; anthers nearly ovate, erect. Pist. Germen ovate, within the tube of the calyx; style thread-shaped, springing from the side of the summit of the germen, as long as the tube; stigma capitate, rough all over with bristly hairs. Peric. leathery, ovate, of one cell. Seed solitary, ovate, obliquely pointed at each end.

Eff. Ch. Calyx coloured, four-cleft, withering. Corolla none. Stamens prominent. Style lateral. Seed solitary, coated.

Obs. The analogy of *Daphne* renders it indispensable to consider this flower likewise as having a coloured calyx, not a corolla, especially as others of the same natural order have *petals*, or *nectaries*, besides; see COROLLA and DAPHNE. Linnæus has observed that, in *P. capitata*, there are eight interior abortive stamens; and in *uniflora*, the rudiments of eight supernumerary anthers, in the bottom of the flower. These instances lessen the value of the reputed petals, nectaries, or glands, which distinguish other genera from this and *Daphne*. Accordingly, of the eight *Passerina* in Linn. Sp. Pl. ed. 2, *sericea*, *dodecandra* and *levigata* are now removed from hence; though recent discoveries have, on the other hand, enlarged the genus to sixteen species. How far any of the new ones may be liable to exception in the generic character, we have no infallible means of deter-

mining, but we shall briefly enumerate the whole. All, except *hirsuta*, *orientalis*, and *canescens*, are natives of the Cape of Good Hope; five are cultivated in Britain.

1. *P. filiformis*. Filiform Sparrow-wort. Linn. Sp. Pl. 513. Ait. Hort. Kew. v. 1. (*P. foliis linearibus*; Linn. Hort. Cliff. 246. t. 11.)—Leaves linear, convex, imbricated in four rows. Branches downy.—This is often seen in green-houses, flowering in summer. The stem is shrubby, repeatedly branched; the younger branches downy, covered with innumerable smooth narrow leaves, about half an inch long. Flowers solitary, small, yellowish, from the bosoms of many leaves together towards the tops of the branches, such leaves having at their base, on each side, a broad, membranous, stilled, furrowed dilatation.—The synonym of Breynius, still retained by Willdenow, belongs to *Gnidia simplex*, under which he repeats it. Linnæus in Hort. Cliff. has several faulty synonyms besides, as he there confounds not only various African, but even European, plants.

2. *P. hirsuta*. Shaggy Sparrow-wort. Linn. Sp. Pl. 513. Ait. n. 2. Sm. Tour. ed. 2. v. 2. 105. Prodr. Fl. Græc. Sibth. v. 1. 262. Fl. Græc. t. 360, unpublished. (Sanamundatertia; Claf. Hist. v. 1. 89. Ger. em. 1506. Breyn. Cent. 1. t. 19. Sefamoides minus; Dalech. Hist. 1670.)—Leaves ovate, fleshy; convex and smooth externally; concave and woolly on the upper side. Stem and flowers woolly.—Native of heathy places, especially near the sea, in the south of France, Spain, Italy, Greece, and the Levant, flowering from November to March.—More bushy and spreading than the former, with totally different leaves. Flowers in little tufts at the ends of short lateral shoots; white and woolly externally; lemon-coloured within, powerfully and delightfully fragrant. Nothing can be more elegant or desirable than this shrub in its wild state; in green-houses it generally makes a poor figure.

3. *P. ericoides*. Heath-like Sparrow-wort. Linn. Mant. 236.—Leaves oblong, obtuse, polished, bluntly keeled; with a woolly furrow above. Tube of the calyx globose and hairy; limb smooth. From the Cape.—This has much the aspect of an *Erica*, and yet is closely allied to both the foregoing, as if intermediate between them, yet perfectly distinct. The branches are downy or woolly when young. Leaves not a quarter of an inch long, of a short, oblong, prismatic shape; green and polished, except a narrow hairy furrow along their upper or inner surface. Flowers axillary, sessile, the accompanying leaves being dilated and ovate. The globose hairy tube of the flower is filled by the germen, and finally forced off by the ripe fruit, which appears to be pulpy, and if so, the plant becomes perhaps more properly a *Daphne*. The seed is black and shining.

4. *P. nervosa*. Ribbed Sparrow-wort. Thunb. Prodr. 75. Willd. n. 4.—"Leaves lanceolate, three-ribbed, smooth. Flowers capitate."—Of this and the following we have seen no specimen.

5. *P. cephalophora*. Great-headed Sparrow-wort. Thunb. ibid. Willd. n. 5.—"Leaves prismatic, in four rows. Heads of flowers woolly." Thunb.

6. *P. capitata*. Smaller-headed Sparrow-wort. Linn. Sp. Pl. 513. Ait. n. 3. (*Thymelæa foliis linearibus alternis, floribus ex uno petiolo copiosis*; Burm. Afric. 133. t. 48 f. 3.)—Leaves linear-awlshaped, smooth on both sides. Heads of flowers downy, or downy, club-shaped, terminal stalks.—Sent from the Cape in 1789, by Mr. F. Masson. It flowers at Kew from June to September, being kept, like all the rest, in the green-house. Burmann describes this as of very lofty growth, with red or purplish branches two feet long, which are repeatedly subdivided; the younger shoots

PASSERINA.

shoots only slightly hairy. *Leaves* scattered, linear, acute, keeled, smooth, convex above; rather more than half an inch long. *Flowers* white, about ten or more in each dense, hairy terminal tuft, whose stalk is thickened upwards, downy, crowned with a hairy ring or border beneath the flowers. Burmann by mistake uses the word *petiolo* for *pedunculo* in his definition above.

7. *P. orientalis*. Oriental Sparrow-wort. Willd. n. 7. (*P. folius lanceolatis*; Gronov. Orient. 48. Sanamunda prima; Clus. Hist. v. 1. 88. Rauwolf. Raif. 281.)—*Leaves* lanceolate, somewhat fleshy, blunt, slightly hairy. *Flowers* axillary. Native of Spain and the Levant, in open sunny spots, flowering in March and April. A bushy *shrub*, about two feet high, with a dark-coloured bark. *Leaves* compared by Clusius to those of *Cneorum tricoccum*, but smaller, shorter, and fleshy, somewhat hairy, ranged in a regular manner along the branches. *Flowers* among the leaves, oblong, resembling those of the Olive, but yellow. *Fruit* like that of *Thymelæa* (*Daphne Gnidium*), but blackish. This is all we can gather from Clusius, whose synonym was originally cited by Linnæus under *Passerina ciliata*, but afterwards struck out, in his own copy of Sp. Pl. Willdenow has established the present species, on the authority of the authors quoted; but if Clusius be right, the *fruit* should make it a *Daphne*. We have a specimen gathered by the Abbè Durand in Barbary, which answers well to the description and figure of Clusius except that the *flowers* are terminal, in little heads on the short lateral branches, and by no means as he represents them.

8. *P. ciliata*. Fringed Sparrow-wort. Linn. Sp. Pl. 514. Willd. n. 8. Thunb. Prodr. 75. (*Thymelæa foliis oblongo-acutis, ad oras fimbriatis, floribus ex foliorum alis spicatis*; Burm. Afric. 129. t. 47. f. 2.)—*Leaves* opposite, lanceolate, acute, many-ribbed, fringed. *Flowers* axillary; their tube capillary, twice as long as the leaves.—Native of the Cape of Good Hope, not of Europe. The history of this species is extremely confused, as the late Mr. Dryander has shewn, in Tr. of Linn. Soc. v. 2. 234, that excellent botanist and critic having been able to prove rather what it was not, than what it was. The plant described in *Hort. Cliff.* is merely *Struthiola virgata*, with which it seems three others are confounded in the Cliffortian collection. The Herbarium of Linnæus has no specimen. We can, therefore, only depend on Burmann's synonym, which Linnæus uniformly cited, and which he has marked in his copy of Burmann's book. Of this the young *branches* are square and purplish. We cannot learn why Willdenow defines the *stem* as villous. The *leaves* are sessile, opposite, crossing each other in pairs, ovato-lanceolate, acute, entire, many-ribbed, half an inch, or more, in length, smooth, except a dense silky marginal fringe. *Flowers* solitary, with a slender tube, about twice the length of the leaf. Burmann's figure has all the appearance of a *Gnidium*. We know nothing of the colour of the *flowers*, for what Willdenow has on that subject is taken from Bergius, whose *P. ciliata* is evidently a different thing. What the Spanish botanists send under this name is either *P. orientalis*, or *Daphne villosa*. Thus we must still leave the matter in uncertainty, till the genus of Burmann's plant be ascertained.

9. *P. uniflora*. One-flowered Sparrow-wort. Linn. Sp. Pl. 514. Ait. n. 4. (*Thymelæa ramosa, linearibus foliis angustis, flore solitario*; Burm. Afric. 131. t. 48. f. 1.)—*Leaves* opposite, triangular-awl-shaped, smooth and even. *Flowers* terminal, solitary; their segments acute.—From the Cape. Miller cultivated it in 1759. This is a humble, bushy, smooth *shrub*, whose slender *branches* are clothed with opposite awl-shaped *leaves*, crossing each other in pairs, and

keeled at the back. *Flowers* solitary at the top of each branch, erect, pale purple; their *tube* hairy, as long as the leaves; limb of the same length, in four ovate, acute, spreading segments, hairy at the back. Burmann's fig. 2. is a doubtful variety. See the next species.

10. *P. grandiflora*. Great-flowered Sparrow-wort. Linn. Suppl. 226. Ait. n. 5? Curt. Mag. t. 292? (*P. lineoides*; Thunb. Prodr. 75? *Thymelæa foliis imbricatis oblongis, floribus fericeis, ramosa*; Brum. Afric. 123. t. 46. f. 1.)—*Leaves* opposite, elliptical, smooth; concave above; convex and somewhat ribbed beneath. *Flowers* terminal, solitary; their segments obtuse.—Such are the characters of the original specimen of this plant, gathered at the Cape by Sparrmann. It seems to be of much loftier growth than the last, with thicker *branches*, downy when young. *Leaves* short and elliptical; very concave above; and no less convex at the under side, which presents itself to the spectator, and which is smooth and shining, furnished with an obscure midrib, but by no means keeled: in a dry state there is some appearance of lateral ribs at the base, and many corrugations all over the surface, but these latter seem the effect of drying. *Flowers* terminal, solitary, twice the size of the last, apparently pale red, very silky externally, and downy within; their segments broadly elliptical and obtuse. *Stamens* and *style* rising above the tube, but shorter than the limb. By this description it will appear that the plant of the Botanical Magazine answers but imperfectly to ours. Its *leaves* are much narrower and longer, *flowers* white, smaller, with acute segments. We are rather inclined to think this latter may be what is represented in Burmann's t. 48. f. 2, which Linnæus, and the editors of Hort. Kew. have cited as *P. uniflora*; and possibly both may be the real *lineoides* of Thunberg; but this we have no materials to determine. This author has nothing under the name of *grandiflora* in his Prodomus, nor any single-flowered species, except *uniflora* and *lineoides*. Burmann's t. 46. f. 1. is evidently our *grandiflora*; his f. 2. may be that of the Bot. Mag. See sp. 17, at the end of the genus.

11. *P. canescens*. Hoary Sparrow-wort. "Schousboe in Act. Hafn." Willd. n. 11.—"Leaves oblong, imbricated in four rows, clothed with soft wool. *Flowers* terminal, woolly."—Native of Morocco. A *shrub* with numerous short *branches*, small, imbricated, very woolly *leaves*, and cylindrical *flowers*. Willd.

12. *P. spicata*. Spiked Sparrow-wort. Linn. Suppl. 226. Willd. n. 12. Thunb. Prodr. 75. Wendl. Obf. (in Roem. Archiv. v. 1?) 19. t. 2. f. 19. Willd.—"Leaves ovate, villous. *Flowers* lateral, solitary."—Gathered by Thunberg, at the Cape. The flowering *branches* are said by Linnæus to resemble a leafy spike. We have no specimen.

13. *P. laxa*. Slender-branched Sparrow-wort. Linn. Suppl. 226. Willd. n. 13. Thunb. Prodr. 75? Wendl. Obf. 20. t. 2. f. 20. Willd.—"Leaves scattered, lanceolate, keeled, smooth. *Branches* hairy, divaricated. *Flowers* capitate, terminal, bristly."—Gathered by Sparrmann at the Cape. If the younger Linnæus has not described from the collection of Thunberg, whom he quotes, a different plant from the marked specimen in his herbarium, given to his father by Sparrmann, nothing can be worse than his description. The *branches* indeed are slender, and loosely spreading, clothed when young with upright hairs. But the *leaves* are of a narrow elliptic-lanceolate form, not ovate, nor are they hairy, as Thunberg describes them, except when young. Nevertheless, the allusion in the Suppl. to *P. ericoides*, convinces us that the specimen in the herbarium is correct. The *flowers* grow several together, in terminal leafy heads, and are slender, clothed

clothed externally with long, erect, filky hairs, the segments of the limb scarcely half the length of the tube.

14. *P. striata*. Rigid Sparrow-wort. Thunb. Prodr. 75. Willd. n. 14. —“Leaves ovate, hairy. Flowers capitate. Branches rigid.” Thunb.—Totally unknown to us.

15. *P. anthylloides*. Hairy-headed Sparrow-wort. Linn. Suppl. 225. Thunb. Prodr. 76. Willd. n. 15. (*Thymelæa foliis imbricatis latioribus subrotundis, ac subtus incanis; Burm. Afric. 126. t. 46. f. 3.*)—Leaves scattered, ovate, hairy. Flowers capitate, terminal, externally bristly.—Gathered by Thunberg, at the Cape. A very handsome species, well described, though not very well figured, by Burmann, whose synonym is unnoticed by Linnæus and his followers. The branches are stout, erect, repeatedly subdivided in a fasciculate or determinate manner, hairy and most leafy while young. Leaves scattered, imbricated, about three-fourths of an inch long, elliptic-ovate, nearly flat, ribbed, hairy beneath, especially when young. Flowers in large terminal heads, encompassed with numerous large hairy leaves; their outside covered with long, dense, erect, white, silvery hairs; the inside smooth, yellow when fresh, black when dry. Burmann, who saw them in the latter state only, supposed them to be purple. Fruit ovate, of a shining brown, clothed with upright bristles. Seed minutely dotted.

16. *P. pentandra*. Pentandrous Sparrow-wort. Thunb. Prodr. 76. Willd. n. 16.—“Leaves ovate, hairy. Spikes ovate, terminal.” Thunb.—Known only by this definition of Thunberg. If the flowers have precisely five stamens, it cannot but excite some doubts as to the genus.

Linnæus admitted into *Passerina*, in the Supplementum, three diandrous species, which formed the genus *Banksia* of Forster. These are now, with many others, established as a separate genus, by the name of *Pimelæa*; see that article. Meanwhile the name of *Banksia* has been applied to a fine genus of the *Proteaceous* order, with which it remains.

Having under *P. grandiflora*, sp. 10, suggested some doubts respecting the *linoides* of Thunberg, we shall here venture to propose that, with what appear to be its synonyms, as a supplementary species, for future consideration.

17. *P. linoides*. Flax-like Sparrow-wort. Thunb. Prodr. 75. (*P. grandiflora*; Curt. Mag. t. 292. Ait. n. 5. *Thymelæa foliis imbricatis angustioribus, floribus sericeis, spicata; Burm. Afric. 125. t. 46. f. 2. T. scaphoides, monomotapensis, five foliolis glabris triquetris cavis cymbæformibus, floribus solitariis amplis summo caule villosis; Pluk. Mant. 180. t. 445. f. 8.*)—Leaves opposite, elliptic-lanceolate, smooth, concave above; convex, even and three-ribbed beneath. Flowers terminal, solitary; their segments acute.—Native of the Cape, from whence it was sent by Mr. Masson in 1789. If we are right in this species, it differs from *P. uniflora* in being a much taller shrub, with elliptical (though narrow) concave leaves, not awl-shaped keeled ones, and the flowers are white, not purplish or blue. From *grandiflora*, to which it is most allied, it differs in having much narrower leaves, even, not rugose, at the back, and flowers but half as large, whose segments are ovate and acute, not obtuse. Plukenet is inaccurately quoted by Burmann, which the confused plan of his work renders it difficult to avoid.

This species is said by Mr. Curtis to be a hardy greenhouse plant, flowering in May and June, and increased without difficulty by cuttings. It is still, if we mistake not, cultivated by Messrs. Lee and Kennedy, at Hammer-smith. S.

PASSERINA, in *Gardening*, contains plants of the shrubby, exotic, evergreen kind, of which the species cultivated are, the filiform sparrow-wort (*P. filiformis*); the shaggy spar-

row-wort (*P. hirsuta*); the headed sparrow-wort (*P. capitata*); the ciliated sparrow-wort (*P. ciliata*); and the one-flowered sparrow-wort (*P. uniflora*).

Method of Culture.—All the sorts may be increased by cuttings planted in a bed of loamy earth, during the summer months, and closely covered with a bell or hand-glass to exclude the air, shading them from the sun, and refreshing them now and then with water. When well rooted they may be planted out, each into a small pot filled with loamy earth; placing them in the shade till they have taken new root; then be removed into a sheltered situation, to remain till the beginning of autumn, when they must be placed in the green-house, and treated as the myrtles. They may likewise be increased by layers.

The second sort may also be raised by sowing the seeds in autumn, soon after they are ripe, in small pots filled with light earth, plunging them into an old bark-bed under a common frame in winter: the plants rise in the spring, and must be treated like the cuttings. The seedling plants grow the most erect, and make the handsomest appearance.

This sort is capable of living abroad in common winters, in a dry soil and warm situation; but in hard frosts the plants are frequently destroyed: one or two should therefore be kept in pots, and sheltered during that season.

They afford variety among other potted green-house plants.

PASSERON ISLANDS, in *Geography*, a cluster of small islands in the Indian sea, near the coast of Africa. S. lat. 11° 10'.

PASSEROTTI, BARTOLOMEO, of Bologna, in *Biography*, was a pupil of Zuccari, and a very ingenious painter, one of whose works, (a picture of Tityus,) was mistaken by the connoisseurs of Bologna for the painting of Michael Angelo, and whose portraits were thought by Guido to have nearly approached those of Titian. He was a skilful draftsman, and aided in forming the Carracci, particularly Agostino; who made his lines in his penned drawings the guide of his graver. He composed a book on anatomy and symmetry: but was not always guided by his own directions. The debauchery of true taste, begun by the freedom of his master, he aided in its progress; and allowed his better talents to bend to facility of execution, and looseness of manner.

PASSE-VERT, in *Ornithology*. See TANAGRA *Cayana*.

PASSIDAGPOUR, in *Geography*, a town of Hindoostan, in Oude; 24 miles N. of Manickpour.

PASSIFLORA, in *Botany*, a name altered by Linnæus, from the *Flos Passionis* of preceding authors. This was applied to the beautiful genus in question, known universally at present by the appellation of Passion Flowers, because the instruments of Christ's passion were thought to be represented in the parts of fructification. The five stamens were compared to his five wounds; the three styles, more aptly, to the nails by which he was fixed to the cross; the column, which elevates the germen, to the cross itself, or to the pillar to which he was bound; and the rays of the nectary to his crown of thorns. There are cuts to be found in some old books, apparently drawn from description, like the hog in armour upon our signs to represent the rhinoceros, in which the flower is made up of the very things themselves. Linn. Gen. 466. Amoen. Acad. v. 1. 211. Schreb. 199. Willd. Sp. Pl. v. 3. 606. Ait. Hort. Kew. ed. 1. v. 3. 306. Mart. Mill. Dict. v. 3. Cavan. Diff. 442. Swartz. Ind. Occ. v. 2. 1133. Juss. 397. Lamarck Dict. v. 3. 32. Illustr. t. 732. (*Granadilla*; Tourn. t. 123, 124. Gærtn. t. 60. Murucua; Tourn. t. 125. Juss. 398. Tacsonia; Juss. 393.)—Class and order, *Gynandria Pentandria*. Linn. *Monadelphia Pentandria*, Cavan. Willd. *Pentandria Trigynia*, Schreb.

PASSIFLORA.

Schreb. which last we prefer. Nat. Ord. *Cucurbitaceæ*, Linn. Juff.

Gen. Ch. *Cal.* Perianth of one leaf, in five deep, oblong, equal segments, much resembling the petals, but pointed below the top; its base concave or tubular. *Cor.* Petals five, oblong, flat, obtuse, usually the size and shape of the calyx, and alternate with its segments; sometimes wanting. Nectary a manifold radiating crown, rarely simple, within the base of the petals; the outer rows longest; the inner of more or less complex, separate or combined, rays or membranes. *Stam.* Filaments five, awl-shaped, spreading, inserted at the base of the germen, upon the column which elevates it; anthers incumbent, pendulous, versatile, oblong, depressed, obtuse. *Pist.* Germen roundish, elevated upon the top of a straight cylindrical column, generally shorter than the petals; styles three, spreading, swelling upwards; stigmas capitate, broad. *Peric.* Berry fleshy, nearly ovate, stalked, of one cell. *Seeds* numerous, ovate, with a pulpy tunic. *Receptacles* of the seeds three, attached lengthwise to the inside of the pericarp.

Ess. Ch. Calyx in five deep coloured segments. Petals five, inserted into the calyx. Nectary a complex radiating crown. Berry stalked. Seeds with a pulpy tunic.

Obs. In the *Murucua* of Tournefort, of which two or three species are now known, the nectary is a conical abrupt membrane, not split into rays. *P. suberosa*, *minima*, and some allied to them, have no petals. We gladly, at the suggestion of Willdenow, resume the Linnæan ideas of the calyx and corolla of this genus, which some new-discovered species, the base of whose calyx is elongated into a cylindrical tube, had formerly induced us, like Cavanilles, to give up. These make the genus *Tacsonia* of Jussieu, *Tacso* of the Peruvians; a name no less exceptionable than the genus. Willdenow errs nevertheless greatly, in still terming the bractæas an involucre.

This is one of the most natural genera that can possibly be. Its root is perennial. Stem climbing to a great extent, branched; more or less shrubby below. Leaves alternate, either undivided or lobed, scarcely ever compound, stalked, with glands, for the most part, upon their stalks, and accompanied by a pair of stipulas, as well as by solitary, simple, spiral tendrils. Flowers on axillary undivided stalks, solitary or in pairs. Bractæas very various in form, usually three, a little remote from the flower, and deciduous; in the long-tubed species often combined into a three-cleft tube, and permanent. Hence when the petals and calyx, both together, came to be considered as a monopetalous corolla, in ten segments, the bractæas were taken for a calyx. See Plant. Ic. ex Herb. Linn. fasc. 1. t. 24, 25.

The species of this genus are numerous. Linnæus in his dissertation, *de Passiflorâ*, published in 1745, and reprinted in the first vol. of his *Amœnitates*, describes 22, with imperfect indications of 18 more. The leaves of those 22, on which the specific differences chiefly depend, are there very neatly engraved. Twenty-six species are given in Sp. Pl. ed. 2, and 28 only in the 14th edition of Syst. Veg. Lamarck in his Dictionary, v. 3, (*Grenadille*), has 35. Cavanilles in his tenth dissertation describes 44, of which 31 are there figured. Willdenow in his Sp. Pl. has 46. We add five to the list, from the fifth volume of Cavanilles' Icones, and four new ones.

The two last-mentioned authors refer the genus to *Monadelphica*, and even Schreber has added a note, in his second vol. 826, that the filaments are combined at their base. This union appears to us so slight, and indeed so often wanting, that we much prefer continuing *Passiflora* in *Pentandria*, where Schreber first placed it. The Linnæan idea, of its

being gynandrous, is totally exploded; for there is no insertion of the filaments upon, or above, the germen; the organs of fructification are merely elevated, all together, on a columnar receptacle.

It is remarkable that every described species is exclusively of South American or West Indian origin, except two found in Virginia and Florida, one in the remote counties of New Caledonia and Norfolk island, and one in Cochinchina; see n. 2.

The whole are disposed in four artificial sections, by the forms of their leaves. Being such general favourites, we must briefly notice every species, especially as Willdenow is, in some points, very imperfect. Since we follow his arrangement, it is needless to cite him throughout, and we shall confine ourselves in the synonyms to what is absolutely essential, or to what he has omitted.

Section 1. *Leaves undivided.* Thirteen species.

1. *P. ferratifolia*. Notch-leaved Passion-flower. Linn. Sp. Pl. 1355. Jacq. Hort. Vind. v. 1. t. 10. Curt. Mag. t. 651.—Leaves ovate, finely serrated, downy beneath.—Native of Surinam. A stove plant in England, flowering copiously all summer long. Houston introduced it to Chelsea garden in 1731. The branches are very long and slender. Leaves green on both sides, smooth above, very soft beneath. Flowers peculiarly delicate, distinguished by the very long capillary curling rays of their nectary, which are purple at the base, pale blue upwards. The scent of the flower is aromatic, but to us unpleasant, partaking of rubarb-root. Curtis commends it.

2. *P. pallida*. Pale Passion-flower. Linn. Sp. Pl. 1355. (*Clematis indica alia*, flore minore pallido; Plum. Amer. t. 89.)—Leaves ovate, entire. Footstalks with two glands. Petals none. Fruit elliptical. Gathered in Hispaniola by Plumier, by whose figure and short description only have we any knowledge of this species. He represents the flowers as scarcely above an inch broad, and destitute of petals, so that it cannot be, as he thinks, the *Murucua-miri* of Piso 248, which is described with very evident red ones. In other respects the figures are not dissimilar. Plumier's has no bractæas, which may be an accidental omission. The fruit is the size and shape of an olive. Piso's cut expresses nothing as to the bractæas or fruit, but he says the latter is pear-shaped. His plant is greatly commended as a deobstruent, even superior in virtues to Saraparilla. Loureiro gives *P. pallida* as a native of Cochinchina; how correctly we know not.

3. *P. adulterina*. Oval-leaved Tubular Passion-flower. Linn. Suppl. 408. Sm. Plant. Ic. t. 24.—Leaves elliptical, revolute, somewhat toothed; woolly at the back. Tube of the calyx thrice as long as the limb. Bractæas distinct. Sent by Mutis to Linnæus from New Granada. A very curious species, the tube of whose calyx is three inches long and exactly cylindrical. Petals purple. Nectary of very short rays. Bractæas three, distinct, ovate-oblong, close to the flower. Young branches woolly, as well as the footstalks, and backs of the leaves. Stipulas serrated. Flowers pendulous. Fruit ovate, spotted.

4. *P. cuprea*. Copper-coloured Passion-flower. Linn. Sp. Pl. 1355. Jacq. Ic. Rar. t. 606.—Leaves ovate, entire, three-ribbed, obtuse. Footstalks without glands. Bractæas minute, deciduous. Fruit elliptical.—Native of the Bahama islands, from whence the seeds were brought by Cateby to England, in 1724. It is a tender stove plant, scarcely, if at all, to be seen here at present. The three-ribbed ovate leaves, glaucous at the back, with several dots between the ribs, and the almost linear petals, and segments of the calyx, both

PASSIFLORA.

both of a dull red on the upper side, mark the species. The glands of the *footstalks* are perhaps entirely wanting, but not the *bractæas*, though the latter are minute, and fall off early, as Jacquin's plate, and even that of Dillenius, expresses.

5. *P. tiliaefolia*. Linden-leaved Passion-flower. Linn. Sp. Pl. 1355. Cavan. Diff. t. 285.—Leaves heart-shaped, entire. Footstalks without glands. Bractæas ovate, shorter than the calyx. Native of the neighbourhood of Lima, where it is cultivated in gardens, but seems never to have been brought to Europe. Cavanilles's plate seems to be fabricated from Feuillée's, at least it does not appear that the former had seen a specimen, any more than Linnæus. The broad heart-shaped *leaves*, reticulated with copious veins at the back, distinguish this from all the foregoing. For the want of glands on their stalks we must rely on Feuillée's figure. The *rays* are crimson, divided by a white line. *Fruit* globular, two inches and a half in diameter, variegated with crimson and yellow, full of sweet watery pulp.

6. *P. maliformis*. Apple-fruited Passion-flower. Linn. Sp. Pl. 1355. Jacq. Hort. Schoenbr. t. 180. Andr. Repof. t. 207.—Leaves ovate, pointed, entire. Footstalks with two glands. Bractæas ovate, downy, longer than the calyx. Native of the West Indies, and known in Jamaica by the name of Sweet Calabash. Our specimens in flower came from the Hon. Mrs. Barrington's stove at Mongewell, in 1795, where the fruit was also ripened, which seems to be much like the last. The *leaves* however are narrower, ovate, very slightly cordate, four inches long. Bractæas large, pale, soft and downy, extending beyond the flower. *Petals* lanceolate, much narrower than the segments of the *calyx*, pale flesh-coloured. *Rays* variegated with red and white in their lower part, with purple and white towards the ends.

7. *P. quadrangularis*. Square-stalked Passion-flower. Linn. Sp. Pl. 1356. Jacq. Amer. t. 143. Sowerby, a single plate.—Leaves ovate, with numerous transverse nerves, entire. Flower-stalk triangular. Stipulas ovate. Stem with four membranous angles.—Native of the West Indies. It has long been in our gardens, but to flower and fruit in perfection, requires a whole spacious stove to itself, along whose horizontal windows it must be trained, being cut down every year to the main trunk, which soon acquires the size of a small cherry-tree. Thus we have seen it at lord Harewood's in Yorkshire, laden with huge *flowers*, magnificently variegated with violet-purple and crimson, and with abundance of green oval *fruit*, the size of a large melon. The cavity however is very small in proportion, filled with sweet pulp, most esteemed perhaps for its rarity. The *stem* has four very sharp, thin, prominent angles, or wings. *Leaves* near a foot long, broad-ovate, entire, smooth, with four or six cup-like glands, full of honey, on their footstalks; ten or twelve transverse ribs spring from the main one at each side. The *stipulas* are ovate, broad, and entire. The triangular *flower-stalk* is well indicated by Mr. Sowerby, in Tr. of Linn. Soc. v. 2. t. 3, as the most certain distinction of this from the next.

8. *P. alata*. Wing-stalked Passion-flower. Ait. Hort. Kew. ed. 1. v. 3. 306. Curt. Mag. t. 66.—Leaves ovate, with few transverse nerves, entire. Flower-stalk cylindrical. Stipulas lanceolate. Stem with four membranous angles.—Native of the West Indies, from whence it is said to have been introduced at Kew in 1772. This is smaller in every part than the last, generally with four, glands only on the *footstalks*; not more than five or six curved transverse ribs, on each side of the principal one; lanceolate *stipulas*, which

are now and then slightly serrated; and much smaller *bractæas*. The *flowers* are very agreeably and powerfully fragrant; the upper sides of the *petals* and *calyx* of a peculiar deep scarlet red, the *rays* erect, as long as the *petals*, variegated with purple, white and crimson, incurved at the points. No *fruit* has ever been produced in England. The plant is propagated by cuttings, and is a great ornament to a stove. We have a specimen gathered by Commerfon in the isle of Bourbon, to which country this species was probably brought originally from the West Indies. We must observe that the *flower-stalks*, cylindrical when fresh, become triangular in drying.

9. *P. laurifolia*. Laurel-leaved Passion-flower. Linn. Sp. Pl. 1356. Jacq. Hort. Vind. v. 2. 76. t. 162.—Leaves elliptical, with a small point, entire, veiny, smooth. Footstalks with two glands at their summit. Bractæas elliptical, concave, toothed, as long as the calyx.—Native of Surinam and Martinico. Known in the West Indies by the name of Water Lemon, its yellow oval fruit being extremely grateful for its sweetness and fragrance. The *leaves* are oval, coriaceous, smooth and shining, reticulated with small veins. *Stipulas* linear-lanceolate, toothed. *Flowers* remarkably handsome, though less vivid in colour than the last; their *petals* and *calyx* reflexed, pale, dotted with red; their *rays* erect, thick, richly speckled with blue and white. This is easily cultivated in a stove, and has been known in England ever since 1690, when the first earl of Portland introduced it. The two doubtful *Passifloræ*, Pl. Surinam. n. 152 and 74, Linn. Am. Acad. v. 8. 262, appear to belong to this.

10. *P. coccinea*. Scarlet Passion-flower. Aubl. Guian. 828. t. 324.—Leaves ovate, somewhat heart-shaped, sharply serrated, nearly smooth. Footstalks with four or six glands. Bractæas elliptical, concave, obtuse, as long as the calyx. Observed by Aublet in Guiana, flowering in August, when also he gathered the *fruit*, which he describes as divided into three cells, full of a pleasant eatable pulp. The strong sharp serratures of the *leaves* distinguish this from all the rest of the present section. Cavanilles, who saw specimens in Jussieu's collection, says they are downy beneath when young; and he also represents the large inflated *bractæas* as serrated throughout; Aublet figures them entire. The *flowers* are of a brilliant red, with orange rays.

11. *P. mucronata*. Pointed Passion-flower. Lamarck Dict. v. 3. 33. Cavan. Diff. t. 282.—Leaves heart-shaped, obtuse, reticulated, smooth, entire. Footstalks with two glands. Stipulas and bractæas broad-ovate, pointed, entire, flat. Stem cylindrical. Gathered by Commerfon at Rio Janeiro. The texture of the *leaves* is like *laurifolia*, but their form is ovate, heart-shaped at the base. *Stipulas* and *bractæas* remarkably pointed; the latter are flat, and hardly above half the length of the *calyx*. The *petals* are narrow, and, as far as we can judge by the dried flower, pale. The young *leaves* seem elegantly speckled.

12. *P. glandulosa*. Glandular Passion-flower. Cavan. Diff. 453. t. 281.—Leaves ovate, acute, reticulated, smooth, entire, footstalks with two glands. Bractæas much shorter than the tube of the calyx, with two glands at their base. Nectary extremely short.—Gathered by Mr. Stoupy in Cayenne. Cavanilles. This appears to be one of the *Tacsonie* of Jussieu, having a tubular *calyx*, though not of any great length; and a very short fringe to the *nectary*, as in our third species. The *leaves* however are smooth, of the nature of *P. laurifolia* and *mucronata*. Bractæas very small; usually awl-shaped; sometimes oblong; always furnished with a pair of glands at their base. *Fruit* the size and shape of a hen's egg.

13. *P. multiflora*. Many-flowered Small Passion-flower.

PASSIFLORA.

Linn. Sp. Pl. 1356. Cavan. Diff. t. 272.—Leaves ovate-oblong, entire, downy on both sides. Flower-stalks aggregate, hairy. Petals none.—Native of the West Indies. Our specimen is from Santa Cruz. This is much smaller, in all its parts, than any of the foregoing, and clothed all over, even the outside of the *calyx*, with soft pubescence. Several small greenish flowers, without petals, grow together from the bosoms of the leaves. Plumier says they are very fragrant.

See n. 29. *P. angustifolia*, as apparently belonging to this section.

Section 2. *Leaves two-lobed.* Ten species.

14. *P. perfoliata*. Stem-clasping Passion-flower.—Linn. Sp. Pl. 1356. Jacq. Hort. Schoenbr. t. 182. Andr. Repof. t. 547.—Leaves smooth, with two oblong, obtuse, spreading lobes, dotted beneath; their base heart-shaped, clasping the stem. Calyx bell-shaped; its segments awl-shaped, much narrower than the petals.—Native of dry bushy places, near the sea, in the south part of Jamaica. It flowered at Messrs. Lee and Kennedy's in 1796, and since in the Comtesse de Vandes' fine collection. The leaves consist of two oblong, almost linear, obtuse, divaricated, entire lobes, connected with a heart-shaped base, with some traces of an intermediate lobe; altogether varying greatly in breadth, and, though supported by short footstalks, often clasping the stem; they are smooth on both sides, reticulated with veins; glaucous, and furnished with a variable row of glandular dots, beneath. *Stipulas* small, awl-shaped. *Flowers* on long stalks, with minute, capillary, remote, deciduous bractees. *Calyx* with a bell-shaped tube, closed by the plaited nectary, and with awl-shaped crimson segments. *Petals* of the same colour, elliptical, an inch long, rather exceeding the calyx. Willdenow well remarks that the flowers are open from their very first budding.

P. normalis is surely but a narrow-leaved variety of this; see n. 16.

15. *P. rubra*. Red-fruited Passion-flower. Linn. Sp. Pl. 1356. Jacq. Ic. Rar. t. 186.—Leaves downy, heart-shaped, with two acute spreading lobes. Flower-stalks hairy, without bractees. Stem round.—Native of the West Indies and of Mexico; not uncommon in our stoves, where it flowers in the spring, and sometimes ripens its small, reddish, ovate fruit. The whole plant is more or less clothed with soft pubescence. *Leaves* rather deeply lobed, entire. *Stipulas* linear. *Flowers* pale flesh-coloured, horizontal. *Germs* bristly. *Fruit* oval, red, with six angles.

16. *P. normalis*. Compass-leaved Passion-flower. Linn. Sp. Pl. 1357.—Leaves smooth, with two linear, obtuse, rectangular lobes, and a small pointed intermediate one; their base emarginate.—Native of Jamaica. Linnæus had it from Browne. This seems to us merely a variety of *perfoliata*, with narrow linear leaves. The synonym of Hernandez does not belong to it, though a part of his figure, with the longest leaf, is like our plant. See *P. Contrayerva*, n. 23.

17. *P. lunata*. Crescent-leaved Passion-flower. Sm. Ic. Pic. t. 1. (*P. biflora*; Cavan. Diff. t. 288.)—Leaves smooth, heart-shaped, with two obtuse spreading lobes, dotted beneath. *Flowers* in pairs. Rays club-shaped, compressed, obtuse.—Native of the West Indies. Long known in our gardens, but mistaken for the *punctata*, which even Linnæus confounded with it in his *Mant.* 492, and *Syst. Veg.*—The lobes are so shallow, broad and spreading, that the whole leaf nearly forms a crescent. *Flowers* in pairs, drooping, about the size of a half crown, smelling like honey. *Petals* white. Rays of the nectary yellow, re-

markably quadrangular. *Bractees* distant, scattered and scateous.

18. *P. Murucuja*. Tubular-crowned Passion-flower. Linn. Sp. Pl. 1357. Cavan. Diff. t. 287.—Leaves smooth, somewhat wedge-shaped, with two obtuse spreading lobes, dotted beneath. Nectary tubular, abrupt, undivided.—Native of the West Indies. We have never seen it alive. The leaves are shorter than in the last, and not heart-shaped at the base. *Flowers* deep red, distinguished by the undivided crown of their nectary. *Bractees* like the last. The column of the *germen* is remarkably long, and the aspect of the whole flower is much like that of *perfoliata*, whose nectary indeed appears likewise tubular, the rays being all brought together round the column, but they are not combined.

19. *P. Vespertilio*. Bat-winged Passion-flower. Linn. Sp. Pl. 1357. *Granadilla bicornis*, &c.; Dill. Elth. t. 137.—Leaves wedge-shaped, smooth, with two, rather pointed, spreading lobes, and two glands at the base. Rays capillary, twisted, longer than the petals.—Native of Surinam and the West Indies. Sherard cultivated it at Eltham in 1732, having received it from Amsterdam. The leaves appear to vary much in shape, and in the dots more or less scattered over their under surface; indeed we are inclined to doubt whether some Surinam specimens, in the Linnæan herbarium, may not be more than a variety. Yet their flower agrees with the true *P. Vespertilio*, whose rays are remarkably long and slender, variously bent and twisted. The calyx is horizontal and shallow, totally unlike that of *perfoliata* and *Murucuja*, and most agreeing with *rubra* and *lunata*, the whole flower being about the size and shape of *rubra*. The berry on one of the Surinam specimens, N^o 76. of the Pl. Surinamenses, Linn. Am. Acad. v. 8. 262, is globular, the size of a large gooseberry; its seeds transversely furrowed.

20. *P. clypeata*. Peltate Bat Passion-flower.—Leaves smooth, peltate, five-ribbed, with two rounded, pointed, widely-spreading lobes.—Of this we have an incomplete specimen in the herbarium of the younger Linnæus, marked as from the West Indies, and a single leaf, sent by Mutis from New Granada, and called in his letter "*Passiflora folium magnum*." This last expands six inches; the former are smaller and younger. The stem is slender, angular. Footstalks an inch or more in length, with two cup-like glands near the base, and in one instance two at the top. Leaves truly peltate, the stalk being inserted above a quarter of an inch from the base. Five strong radiating ribs spring from its insertion; with two much smaller, directed towards the base. Both sides are smooth, reticulated with innumerable veins; lobes very broad, rounded, with short points; in the leaf from Mutis only there is a shallow, minutely pointed, intermediate lobe; but that character is sometimes found to be variable in this tribe. A few large glandular dots are scattered towards the margins of the lobes. The stipulas are minute and awl-shaped. No traces of flowers are to be seen. This seems a most distinct species, though mentioned hitherto by no author that we have met with. Its habit comes very near *hederacea* of Cavanilles, see n. 33, but if there be any reliance on the outline of the leaves, they must be different.

21. *P. oblongata*. Oblong-leaved Passion-flower. Willd. n. 20. Swartz. Ind. Occ. v. 2. 1135.—"Leaves oblong; dotted beneath; rounded at the base; with two erect, lunate, very short terminal lobes, and a minute intermediate bristle."—Gathered by Swartz, on shrubby hills in Jamaica. The stem is rough and rigid, climbing by its tendrils to a great height. Leaves stalked, two or three inches long, entire, three-ribbed, veiny, thin, smooth; paler beneath, with a double row of remote dots. Footstalks without glands. Stipulas linear-awl-shaped, rigid. Flowers solitary, rather large;

PASSIFLORA.

large; of their structure nothing is mentioned. Our knowledge of this species is derived entirely from Swartz's work.

22. *P. capsularis*. Capsular Passion-flower. Linn. Sp. Pl. 1357. (*Granadilla fructu rubente, folio bicorni*; Plum. Ic. 129. t. 138. *Clematis indica, flore clavato, &c.*; Plum. Amer. 68, the first species, with a triangular stem.)—Leaves smooth, somewhat heart-shaped, with two acute slightly spreading lobes. Flower-stalks without bractæas. Stem triangular.—Found by Plumier in Hispaniola only. The late Hon. Mrs. Barrington received a plant from Jamaica, which flowered in Oct. 1793, at Messrs. Lee and Kennedy's, and answers well to this species, which Linnæus never saw, nor has any succeeding author been able to verify. It is in many points allied to *P. rubra*, n. 15, along with which Plumier describes it; but is distinguished by the triangular branches; the smoothness of the leaves, which in our specimen are scarcely cordate at the base. This last character, and the flowers being in pairs, not solitary, are the only circumstances in which our Jamaica plant does not correctly agree with Plumier's figure and description. The fruit is said to be longer, and more pointed, than that of *rubra*, apparently with less pulp. The rays are shorter than the petals, somewhat club-shaped. Calyx shallow and broad. Germen smooth. There are two glands at the base of the leaf, at least in our specimen.—In the herbarium of the younger Linnæus are specimens, without flowers, gathered by Smeathman in the West Indies, which agree very nearly with what we have just described, except that the leaves have much narrower, more deeply separated, lobes, elegantly variegated, with a white central stripe on the upper side. We procured a similar leaf in 1791, from the stove of Mrs. Barrington, who had the plant from Jamaica. This may be a distinct and very curious species, which the flowers, when known, may serve to distinguish hereafter.

23. *P. Contrayerva*. Horse-shoe Passion-flower. (*Coanepilli seu Contrayerva*; Hernand. Mex. 301.)—Leaves smooth, without glands, somewhat heart-shaped, with two obtuse, oblong, pointless, slightly spreading lobes. Foot-stalks without glands or stipulas. Stem angular. Calyx spreading.—This appears to us a very interesting species, hitherto totally misunderstood. We have unmarked specimens in the two Linnæan herbariums, answering precisely to the figure and description of Hernandez, whose synonym was certainly very ill applied by Linnæus to *normalis*; see n. 16. Hernandez says his plant is found in various parts of the country of Mexico, and the root is famous for its medicinal virtues, being sweetish, with some pungency and fragrance, and considered as a powerful counter-poison, deobstruent, cordial, &c.; three ounces of the bruised root being a dose. Hence the appellation of *Contrayerva*, which it possesses in common with *Dorstenia*, and some other reputed counter-poisons. Hernandez well describes the leaves as shaped like a crescent, or a horse-shoe. They are about an inch long, his figure being scarcely half the natural size. He represents three dots, like nails, on their disk, which he says are yellow, but which our specimens do not shew. The stems are slender, angular, twining, and climbing by tendrils. We have no flowers. He describes them as shaped like a carnation, but much smaller, and of many colours; the berries globular, dark chestnut-coloured. His figure well expresses one of the flattish, spreading, or shallow-flowered kinds, with thick horizontal rays, and a moderately elevated column. Root as thick as the little finger, long and twisted.

Section 3. *Leaves three-lobed*. Twenty-seven species.

24. *P. rotundifolia*. Round-leaved Passion-flower. Linn.

Sp. Pl. 1357. Cavan. Diff. t. 290. Willd. n. 22.—Leaves roundish, with three very shallow equal lobes; dotted beneath and at the base. Footstalks without glands. Calyx flat. Nectary with spreading rays.—Native of South America and the West Indies; sent to Kew in 1786, by Baron Hake, but we have never heard of its flowering in any garden. The leaves are about two inches in length and breadth, quite smooth on both sides in our specimen, as is also the ripe fruit, though authors attribute some downiness to both. The flowers we have not seen. Cavanilles and Plumier represent them of the size and general form of *rubra* and *capsularis*, with thickish rays.

25. *P. orbiculata*. Orbicular Tubular-crowned Passion-flower. Cavan. Diff. 456. t. 286. Willd. n. 23.—Leaves roundish, with three very shallow obtuse lobes; dotted beneath, but not at the base. Footstalks without glands. Petals none. Nectary tubular, abrupt, undivided.—Native of Hispaniola. Given by Thouin to the younger Linnæus. The leaves of this rare species much resemble the last, but the lobes are very obtuse, the middle one broadest; in a young state the under side is downy, and always very much reticulated with prominent veins. Stipulas and bractæas awl-shaped. Tendrils short. Flowers in pairs, crimson, the size of *Murucuja*, n. 18, and with the same undivided nectary, but no petals. The base of the calyx is globose; when young downy, like the flower-stalks. Column very long and slender, extending far beyond the calyx.

26. *P. punctata*. Dotted Passion-flower. Linn. Sp. Pl. 1358. Cavan. Diff. t. 269. (*Granadilla folio tricuspido, obtuso et oculato*; Feuill. Peruv. 718. t. 11.)—Leaves roundish, slightly heart-shaped, with three shallow obtuse lobes, and many rows of dots at the back, but not at the base. Footstalks without glands. Calyx flat. Rays spreading half the length of the petals.—Gathered by Feuillée in a garden at Malambo, a suburb on the north of Lima. He never met with this plant elsewhere. Cavanilles saw it in flower at Paris. We have never seen a specimen, nor did Linnæus; his description in the *Mant.* and *Syst. Veg.* copied by Willdenow, being taken from our *lunata*, which is the *punctata* of Ait. Hort. Kew. ed. 1. (See *Sm. Ic. Pic. t. 1.*) The leaves are broader and shorter than in the two last described, and more copiously dotted at the back. Flowers solitary, with a flattish expanded calyx, whitish ovate petals, and violet rays, tipped with bright yellow, which are much shorter than the petals, and somewhat club-shaped. Fruit rather oval, with a sweet pulp.

27. *P. lutea*. Small Yellow Passion-flower. Linn. Sp. Pl. 1358. Jacq. Ic. Rar. t. 607. Michaux Boreal-Amer. v. 2. 37.—Leaves heart-shaped, three-lobed, obtuse, smooth. Footstalks downy, without glands. Flowers in pairs. Petals half the breadth of the calyx.—Native of North America, from Virginia to Florida, as well as of Jamaica. It has long been in our gardens, but is little valued, the flowers being small and pale. The leaves somewhat resemble, in shape and size, those of *Anemone Hepatica*. They are smooth, glaucous beneath, without dots or glands. Footstalks and flower-stalks hairy, without glands, or bractæas. Flowers horizontal, flattish, with narrow pale-yellow petals, and spreading rays of the same length and colour.

28. *P. pannonia*. Cloth-leaved Passion-flower.—Leaves heart-shaped, unequally three-lobed, bluntish, downy on both sides, as well as the stalks, tendrils, and branches. Petals none. Germen bristly.—Native of the West Indies. We obtained a specimen from Kew garden, in November, 1791, but have never elsewhere seen or heard of this species, which from its sordid habit, and minute, greenish, inconspicuous flowers, is likely to have generally escaped notice.

PASSIFLORA.

The form and size of the *leaves* are like *rubra*, n. 15, and some of them have actually but two lobes, as in that; but most have a broad central lobe, as long as the others. Every part is pubescent like *rubra*, and the *germen* bristly, but the *flowers* are otherwise totally unlike that species, scarcely a quarter so large, destitute of *petals*, and with a very small *nectary*; though their stalks bear conspicuous finely three-cleft *bractæas*, which *rubra* wants. However deficient in splendour, this plant is worthy the attention of a curious botanist, on account of its various resemblances and affinities. See *fatida* and *holosericea* hereafter.

29. *P. angustifolia*. Narrow-leaved Passion-flower. Willd. n. 26. Swartz Ind. Occ. v. 2. 1133. (*P. heterophylla*; Ait. n. 13. Jacq. Hort. Schoenbr. v. 2. 28. t. 181. *P. longifolia*; Cavan. Diff. t. 270.)—Leaves smooth; the lower ones three-lobed; the rest undivided, lanceolate, elongated, pointed. Footstalks with two glands. Petals none.—Native of thickets in Jamaica; said to have been brought to England about the year 1773. It flowers in the stove most part of the summer. Those who should observe the upper *leaves* only, which are quite undivided, long, ovato-lanceolate, and taper-pointed, would refer this species to the first section; but as more or less of the lower *leaves* are furnished with one or two lateral lobes, it obtains a place here, among species to which it is most naturally allied. Some indeed have thought it is a variety of the next. The *footstalks* bear a pair of minute, globular, stalked glands, near the leaf. *Stipulas* bristle-shaped. *Flowers* in pairs, small, about half an inch wide, yellowish, on slender stalks without *bractæas*. *Calyx* spreading or recurved, slightly concave at the base. *Petals* none. *Rays* erect, recurved, yellow, rather shorter than the *calyx*, purple at the base. *Berry* roundish, deep violet, sweet, the size of a black currant.

30. *P. minima*. Dwarf Passion-flower. Linn. Sp. Pl. 1359. Jacq. Hort. Vind. v. 1. t. 20. Cavan. Diff. t. 266.—Leaves deeply three-lobed, entire, rather downy; the middle lobe longest. Footstalks with two glands. Petals none.—Native of Curassao; not uncommon in stoves, flowering in July. Every part of the herbage, in all our specimens, is finely downy, but not at all hoary. *Leaves* rather paler at the back, but not glaucous; the side lobes are the shortest; all of an ovate, or rounded shape, sometimes more oblong, and in that case more deeply separated. The *glands*, as well as the *flowers*, nearly accord with the last. The *calyx* however is downy at the back, and the *stipulas* are downy, and rather broader. *P. hirsuta*, n. 38, seems to be a hairy variety of this.

31. *P. suberosa*. Cork-barked Passion-flower. Linn. Sp. Pl. 1358. Jacq. Hort. Vind. v. 2. 77. t. 163. Sm. Exot. Bot. t. 28.—Leaves three-lobed, entire, smooth; the lateral lobes very short. Footstalks with two glands. Petals none. Fruit ovate. Stem with corky angles.—Native of the West Indies; easily cultivated in a stove, where it bears greenish *flowers*, and ovate black *fruit*, both twice the size of the two last species, throughout the summer and autumn. The *leaves* are of a dark shining green above, paler beneath, of a broad ovate figure, with two small, acute, lateral lobes. *Rays* of a much shorter proportion than the last, recurved at the points. *Germen* speckled with white. The bark of the old *stems* is white, and very corky; something of which indeed is observable in *angustifolia* and *minima*.

32. *P. peltata*. Peltate Spreading-lobed Passion-flower. Cavan. Diff. 447. t. 274. Willd. n. 29. (*Clematis indica*, folio angusto trifido, fructu oliviformi; Plum. Amer. 70. t. 85.—Leaves peltate, smooth, three-ribbed, with three

deep, equal, oblong, spreading lobes. Footstalks with two glands. Flowers solitary, without petals.—Found in hedges in the Antilles, according to Plumier; few other botanists have seen it. The peltate insertion of the *footstalks*, and the large, deeply three-lobed *leaves*, mark this species. Its *flowers* are twice the size of *P. suberosa*, with longer and straighter rays. *Fruit* much the same.

33. *P. hederacea*. Peltate Ivy Passion-flower. Cavan. Diff. 448. Willd. n. 30. (*Clematis indica*, folio hederaceo, major, fructu oliviformi; Plum. Amer. 70. t. 84.)—Leaves peltate, ovate, smooth, five-ribbed, three-lobed. Footstalks with two glands. Flowers solitary, without petals.—From the same country as the last, where Plumier only appears to have seen it. The *leaves* are peltate and five-ribbed exactly as in our *clypeata*, n. 20, but of a very different outline, rounded at the base, and terminating in three rather spreading but not deep lobes. Their size and appearance, except having but three lobes, is like our broadest variety of *Hedera helix*, called Irish Ivy. *Flowers* like the last.

34. *P. viridiflora*. Tubular Green Passion-flower. Cavan. Ic. v. 5. 15. t. 424.—Leaves peltate, smooth, with three deep obovate lobes. Tube of the calyx as long as its segments. Petals and bractæas wanting.—Gathered by Louis Née, near Acapulco, flowering in February. The *leaves* have seven radiating ribs, and three deep lobes, of which the middle one especially is greatly contracted at the base; each two or three inches long. The *footstalks* have two sessile glands towards their origin. *Stipulas* lanceolate. *Bractæas* and *petals* wanting. *Calyx* green; its tube an inch long; segments spreading, linear-oblong, of about the same length. *Rays* short, combined by an entire base. *Column* very slender. A curious species, known only from the work of Cavanilles. We have however a West Indian specimen from the late Mr. Smeathman, which answers to it nearly in every respect, except being hairy all over.

35. *P. reflexa*. Reflexed Passion-flower. (*P. reflexiflora*; Cavan. Ic. v. 5. 15. t. 425.)—Leaves peltate, smooth, with three deep, spreading, obtuse lobes; their sinuses and stalks glandular. Tube of the calyx as long as its segments. Bractæas ovate, veiny.—Gathered by Louis Née near Panama. About the size of the last. The *leaves* are somewhat hastate, entire, five-ribbed, with six stalked glands on their *footstalks*, and as many sessile ones in each sinus, between the lobes. *Stipulas* large, half-ovate, wavy. *Bractæas* large, veiny. Tube of the *calyx* an inch long, the thickness of a goose-quill, its segments, as well as the *petals*, oblong, of the same length, reflexed, scarlet. *Nectary* a double fringe, of minute upright rays. *Column* very slender.

36. *P. glauca*. Glaucescent-leaved Passion-flower. Ait. n. 11. Willd. n. 31. (*P. stipulata*; Aubl. Guian. t. 325. *Balsamina altera*, indica, &c.; Ambros. Phyt. 99.)—Leaves slightly peltate, heart-shaped, smooth, with three broad, spreading lobes; glaucous beneath. Footstalks glandular. Base of the calyx hemispherical. Bractæas minute.—Native of Cayenne, introduced by Messrs. Lee and Kennedy in 1779. It flowers in the stove in August and September, and is very ornamental as well as fragrant. The *flowers* somewhat resemble those of *P. serratifolia*, and are remarkable for the innumerable dense tufted filaments of their *nectary*, the outermost nearly equal to the *petals*, the rest gradually shorter and more erect. Every part of the plant is somewhat glaucous, and very smooth. *Leaves* divided about half way down. *Stipulas* large, half heart-shaped. *Bractæas* a quarter of an inch long, at some distance from the convex glaucous base of the calyx. Nobody before us has noticed the old figure of Ambrosinus, though

PASSIFLORA.

though it cannot be mistaken, and is the only one with flowers.

37. *P. holosericea*. Velvet-leaved Passion-flower. Linn. Sp. Pl. 1359. Cavan. Diff. t. 291. (*Granadilla folio hastato holosericeo*, &c.; Mart. Decad. t. 51.)—Leaves ovate, three-lobed, downy on both surfaces, with a recurved tooth on each side at the base.—Native of Vera Cruz, from whence it was originally sent by Houttoun. The leaves are remarkable for their exquisite velvet-like softness, and for the two recurved teeth at their base; their side-lobes are small. Flowers flat, one inch and a half broad. Petals white, often minutely dotted with red, as well as the segments of the calyx, which they resemble in size and shape. Rays spreading, straight, parti-coloured with red and yellow.

38. *P. hirsuta*. Hairy Passion-flower. Linn. Sp. Pl. 1359. Ait. n. 16. Cavan. Diff. 443. (*Clematis indica, flore minimo pallido, foliis hirsutis*; Plum. Amer. 74. t. 88. f. A.)—Leaves hairy, with three oblong entire lobes, the middlemost longest; the lower leaves smooth on the upper side. Footstalks with two glands. *Solander in Ait. Hort. Kew.*—Native of the West Indies. Sent to Kew in 1778, where it is said to flower in the stove in September. This is a doubtful species. What the younger Linnæus collected for it in England, if we mistake not, is certainly only a hairy specimen of *minima*, n. 30, and has no petals. Plukenet's t. 212. f. 1. and the figure in Hermann's Paradisus, p. 176, appear to belong to some species unknown to us, with jagged leaves, and flowers with petals. Linnæus, having no specimen, evidently adopted the species from Plumier, whose plant we believe to be no other than *minima*, and whose solitary leaf is copied in Am. Acad. f. 16.

39. *P. fetida*. Stinking Passion-flower. Linn. Sp. Pl. 1359. "Giseke Ic. t. 20." Willd. n. 34. Cavan. Diff. t. 289.—Leaves hairy, heart-shaped, somewhat three-lobed. Bractæas repeatedly pinnatifid, in capillary glandular segments, like the stipulas.—Native of the West Indies; not rare in our stoves, where it blossoms in summer, and ripens fruit, which resembles a gooseberry in size, and somewhat in flavour. The whole plant is hairy, viscid, and fetid, of a pale green. Flowers whitish, distinguished from all the foregoing, by large finely divided bractæas, encompassing them in the bud, as well as the fruit, like the involucre of *Nigella damascena*. The root is said to be annual or biennial, but we doubt whether it be so in a state of nature.

40. *P. ciliata*. Fringe-leaved Passion-flower. Ait. n. 18. Willd. n. 35. Curt. Mag. t. 288.—Leaves smooth, with three wavy, somewhat ferrated, fringed lobes; the middlemost longest. Bractæas repeatedly pinnatifid, in capillary segments, like the stipulas.—Mrs. Norman, a lady long celebrated for the cultivation of botanical rarities, received this plant from Jamaica in 1783, or earlier. Linnæus knew it not. The bractæas resemble the last, but are not so much divided. Petals and calyx pink. Rays spreading, variegated with purple and white. The leaves are coriaceous, veiny, quite smooth except their margin. It is not impossible that Hermann's t. 176 may be a diminished and very imperfect representation of this; see n. 38.

41. *P. ferrulata*. Finely-ferrated Passion-flower. Jacq. Obs. fasc. 2. 26. t. 46. f. 2. Willd. n. 36.—Leaves three-lobed, very minutely ferrated; the middle lobe longest. Footstalks with two glands. Bractæas distinct, entire.—Gathered by Jacquin at Carthage. He compares it with *incarnata*, n. 44, from which he says it is very certainly distinguished by the leaves not being cut away close to the side ribs at the base, and by the minuteness of their

ferratures. The flowers are variegated with purple and white, delightfully fragrant, two inches and a half wide.

42. *P. aurantia*. Norfolk-island Passion-flower. Forst. Prodr. 62. Willd. n. 37. Andr. Repof. t. 295.—Leaves smooth, dotted beneath, with three spreading bluntish lobes; rounded at the base. Calyx somewhat tubular, longer than the petals. Nectary tubular, abrupt, lobed, surrounded with upright rays.—Native of New Caledonia and of Norfolk Island. It flowers copiously in a stove in summer, requiring a light dry soil. The leaves are sometimes slightly five-lobed. Flowers orange, the tube of their nectary green, longer than the purple upright rays which surround it. This is akin to n. 24 and 25 of our list, near which Willdenow ought to have placed it. The nectary is very peculiar, being, like the whole flower, shaped much as in *P. Mucuruja*, n. 18, but nevertheless accompanied with rays; its orifice moreover is lobed or jagged.

43. *P. cuneifolia*. Wedge-leaved Passion-flower. Cavan. Diff. 460. t. 292. Willd. n. 38.—Leaves deeply three-lobed, ferrated, acute; three-ribbed, with two glands, at the base. Bractæas distinct, elliptical, entire. Calyx flat. Rays not half so long as the petals.—Native of America. Seen by Cavanilles in Thouin's herbarium. We have it not. The specific characters distinguish it from the next, which it greatly resembles.

44. *P. incarnata*. Flesh-coloured Passion-flower, Maracoc, or May-cock. Linn. Sp. Pl. 1360. Sm. Insects of Georgia, t. 12. Jacq. Ic. Rar. t. 187. (*Clematis trifolia, five flos passionis*; Ger. em. 1592.)—Leaves deeply three-lobed, ferrated, acute; three-ribbed, with two glands, at the base. Bractæas distinct, lanceolate, with glandular teeth. Calyx flat. Rays as long as the petals.—Native of North America. One of the first species introduced to the knowledge of European botanists, and cultivated here in the days of Gerard and Parkinson, though now seldom met with, as it will scarcely ever survive the English winter, or rather spring. It however merits a place in the conservatory. The leaves are very deeply three-lobed, three-ribbed, ferrated, finely downy on both sides; paler beneath. Flowers rather large, flesh-coloured or pale purple, the long slender spreading rays elegantly speckled with crimson and white. Jacquin's figure is too blue.

45. *P. sanguinea*. Blood-coloured Passion-flower.—Leaves deeply three-lobed, ferrated, acute, without glands. Bractæas distinct, lanceolate, with glandular teeth. Calyx downy, its tube half as long as the segments. Rays half the length of the petals. Stamens linear, flat.—Gathered by Smeathman in the West Indies. A very fine species, of which we can find no description nor figure. The branches, and all the stalks, are downy; tendrils smooth. Footstalks, and base of the leaves, destitute of glands; ferratures rather coarse; upper surface smooth; lower downy, with prominent ribs and veins. The stipulas seem fallen. Flowers near three inches broad; as far as can be judged from the dried specimen, they appear of a rich deep red. Tube of the calyx above half an inch, or twice its diameter, in length, clothed with fine rusty down; limb horizontal, its segments linear-lanceolate, with the awl-shaped tips longer than usual; petals rather smaller than the calyx, but of the same shape and colour. Rays reddish, slender, much curled in a dry state, but apparently half the length of the petals, the inner row erect about the column, which is tall and slender. Filaments remarkably broad and flat, somewhat combined at the base, with large anthers. Germen finely downy.

46. *P. peduncularis*. Long-stalked Passion-flower. Cavan. Ic. v. 5. t. 426.—Leaves with three rounded ferrated lobes. Bractæas combined, tubular, downy. Calyx downy, its

PASSIFLORA.

its tube nearly equal to the segments. Rays very minute. Stem square.—Gathered by Louis Née, in several places in Peru, flowering in March. The square stem, which is slightly downy, and the bractæ united into an ovate, obtuse, slightly notched, and three-cleft tube, full half as long as the tube of the calyx, are characteristic of this species, which is one of Jussieu's genus *Tafsonia*, like the four following. The leaves of this are rather broader than long, their lobes broad and rounded, equally ferrated; glaucous, and in some degree downy, at the back. Footstalks with four sessile glands. Stipulas squarish, toothed. Flower-stalks near four inches long, being twice the length of the leaves. Flowers rose-coloured, large and handsome, externally downy; their petals elliptical, an inch long, a little shorter than the calyx. Nectary crowned with minute teeth rather than rays, as in *adulterina*, n. 3. Filaments flattened. Fruit globose, rather downy, one inch and a half in diameter.

47. *P. trifoliata*. Three-leaved Passion-flower. Cavan. Ic. v. 5. 16. t. 427.—Leaves ternate, elliptical, downy, entire. Bractæas distinct, toothed. Tube of the calyx as long as the segments, tumid at the base. Rays very minute.—Native of Peru and Chili, where it was found by Louis Née, flowering in March and April.—Remarkable for its truly ternate leaves. The stipulas are half heart-shaped, with bristly ferratures. Footstalks downy, without glands. Bractæas large, ovate, downy, with broad, blunt, tooth-like ferratures, half an inch below the calyx. Flowers rose-coloured, large and handsome, like the last, but with a longer calyx-tube, whose base is inflated and umbilicated.

48. *P. pennipes*. Wing-footed Passion-flower. (*P. pinnatipula*; Cavan. Ic. v. 5. 16. t. 428.)—Leaves three-lobed, ferrated, acute; woolly beneath. Bractæas distinct, ferrated. Tube of the calyx as long as the segments. Rays half as long as the petals. Stipulas deeply pinnatifid.—Found by Louis Née in various parts of Chili, from whence also we have a specimen, gathered by Mr. Menzies. The leaves are three-cleft more than half way, reticulated, ferrated, two or three inches long; very smooth, and bright green, above; their backs, like the branches and stalks, clothed with dense, white, woolly pubescence. Stipulas finely and deeply pinnatifid, smooth. Bractæas ovate, sharply ferrated, deciduous, rather downy externally only. Flowers much larger than in the last, of a pale rose-colour, very finely downy externally, as is also the germen. Rays capillary, spreading on the petals, and full half as long. Column remarkably angular, smooth. With great reluctance we have been obliged to alter the uncouth name given by our lamented correspondent Cavanilles, but have retained his idea. The singularly divided stipulas are like a pair of wings to the footstalk.

49. *P. tomentosa*. Downy Long-tubed Passion-flower. Cavan. Diff. 450. t. 275, 276. Willd. n. 40.—Leaves three-lobed, ferrated; downy on both sides. Bractæas combined, tubular. Tube of the calyx thrice as long as the segments.—Gathered long ago, by Joseph de Jussieu, in Peru. His specimens were seen in his celebrated nephew's herbarium at Paris, by Lamarck and Cavanilles, from whose publications only our knowledge concerning this magnificent plant is derived. The respective proportions of the flower, and its minute rays, agree with our third species; but the whole flower appears to be larger, and the bractæas are combined into a sharply three-cleft downy tube. The leaves have three broad, moderately deep, lobes, and, like the rest of the plant, are clothed with fine short down. The footstalks bear numerous stalked glands. The stipulas are half-ovate, pointed, and downy. The flower expands

three inches, and is said to be rose-coloured; its tube is five inches long, whether smooth, or downy as in the next, is not mentioned; nectary a row of very small, roundish, slightly stalked glands, or obtuse rays, crowning the tube. Fruit ovate-oblong, soft, full of yellow eatable pulp. The Peruvians know this plant by the name of *Tacfo*.

50. *P. mixta*. Smooth-leaved Long-tubed Passion-flower. Linn. Suppl. 408. Sm. Plant. Ic. t. 25. Willd. n. 41. (*P. longiflora*; Lamarck, n. 28. *P. Tacfo*; Cavan. Diff. 451. t. 277.)—Leaves with three or five lobes, ferrated, acute; smooth on both sides. Bractæas combined, tubular. Tube of the calyx thrice as long as the segments.—Sent by Mutis from New Granada to Linnæus, along with drawings, in Indian ink, of this and our third species. The present differs from the last in having smooth, more deeply lobed leaves, whose side-lobes are occasionally slightly divided; but that such a circumstance is accidental, may be presumed, not only from the coincidence of every other part, but because there are always five ribs, more or less apparent; see the plates quoted. The footstalks bear about six glands, and are rather downy; the flower-stalks, tubular bractæas, and especially the outside of the calyx, are finely and densely pubescent. Flowers: rose-coloured or purplish, a little smaller than those of *P. tomentosa*, with much the same sort of nectary. Fruit obovate, with a slight longitudinal furrow.—Linnæus roundly asserts that this species is produced between *incarnata* and *adulterina*, for which there is no authority, except the affinity of its fructification to the latter, and some resemblance in the shape of its leaves to the former. Nothing could be greater acquisitions to our conservatories than these tubular Passion-flowers, whose seeds the Spaniards surely might obtain with great ease, and which would probably prove almost hardy in our climate, like the elegant *Fuchsia*, *Cobæa*, and other late discoveries, from the same country.

Section 4.—Leaves with many segments. Five species.

51. *P. carulea*. Common Blue Passion-flower. Linn. Sp. Pl. 1360. Willd. n. 42. Cavan. Diff. 461. t. 295. Mill. Illustr. t. 74. Curt. Mag. t. 28.—Leaves deeply palmate, in five entire smooth segments.—Native of Brasil. This species, though not brought to Europe till long after the *incarnata*, has now, from its much greater hardness, and facility of culture, taken place of that, and is generally dispersed throughout the more temperate parts of Europe. In Italy, Spain, Portugal, and the Levant, it combines with the Jasmine, more especially, to form luxuriant bowers; and in those countries bears abundance of orange-coloured fruit, as well as fragrant and beautiful flowers. With us it only blossoms in the open air; requiring protection for its roots and stems against hard frosts. Loureiro speaks of *P. carulea* as wild about Canton in China, and there is a narrow-leaved rather tender variety, known in our stoves, reported to have come from that country, or the East Indies. But we are inclined to suspect both may originally have gone thither from Europe or the Brasils.—The whole plant is smooth, of a rather glaucous hue, and the entire edges of the leaves distinguish it from all the rest of this section. Stipulas half-heart-shaped, wavy. Bractæas ovate, concave, entire, scarcely half so long as the full-grown bud. Calyx spreading and nearly flat, its segments elliptic-oblong, like the petals, and of the same white, or pale greenish, hue. Rays spreading widely, shorter than the petals, purple at the base, white in the middle, blue at the end. Each flower lasts only one day, but there is a copious succession.

52. *P. filamentosa*. Long-rayed Blue Passion-flower. Cavan. Diff. 461. t. 294. Willd. n. 43.—Leaves palmate,

in five acute serrated segments. Footstalks with two sessile glands. Bractæas distinct, serrated. Rays longer than the corolla.—Native of America. Cavanilles described it from the garden of the late Duke del Infantado, to whose family he was preceptor. We had, at the first view of his figure, for we have seen no specimen, a suspicion that this might be a variety of some three-lobed species. The glands of the footstalks agree with those of *ferrulata*, n. 41, but the shape of the leaves, and their coarser serratures, as well as the serrated bractæas, materially differ. From *incarnata*, n. 44, and *cuneifolia*, n. 43, the only species besides with which it can be compared, it is distinguished by the leaves not being cut away close to the ribs at the base, as well as by the situation of the glands on their stalks, and the presence of other glands in the sinuses. The stipulas moreover are half-pinnatifid, not awl-shaped and entire; and the bractæas differ in size from *incarnata*, and in their serratures from *cuneifolia*. The leaves we understand to be smooth; their side-lobes much smaller than the others. Flower coloured somewhat like the *cerulea*; furnished with five rows of rays, of which the outermost extend beyond the calyx and petals. Fruit globose, with white viscid pulp.

53. *P. ferrata*. Many-lobed Serrated Passion-flower. Linn. Syst. ed. 10. v. 2. 1248. Syst. Veg. ed. 14. 823. Willd. n. 44. Cavan. Diff. 449. t. 296. (*P. ferratodigitata*; Linn. Sp. Pl. ed. 1. 960. *P. digitata*; ed. 2. 1360. *Clematis indica polyphylla major*, flore clavato, fructu colocythidis; Plum. Amer. 62. t. 79.)—Leaves palmate, in five or seven very deep serrated segments. Footstalks with several glands. Bractæas combined, entire.—Gathered by Plumier in Martinico, in one place only, near St. Mary's river. Cavanilles saw a specimen in Jussieu's collection, and there is one without flowers, in that of the younger Linnæus; but this very magnificent species is unknown in our gardens. The flowers equal even those of *quadrangularis*, n. 7, in magnitude and splendour, and the broad many-lobed leaves, whose under side is somewhat downy, are much more handsome. Plumier says the shoots are as large, hard, and knotty as those of a vine, spreading widely over the trees and bushes, which they decorate with verdant foliage. The flower-bud, invested with its large, ovate, pale, purple-veined bractæas, combined at their base, and entire at their margin, is as big as a hen's egg. The calyx has a broad funnel-shaped base; its segments are of a violet colour, like the petals, but much broader, each about one inch and a half long. Rays about the same length, very numerous, thick, and somewhat angular, in a double row, the outermost shortest, each ray whitish at the point, violet in the middle, paler from thence to the base, with five violet bands. The tube of the calyx is internally lined with short, red-headed, glandular rays. Fruit as big as an orange, with a thick coat. Plumier did not meet with it ripe, but it seems much like that of the *quadrangularis* in colour and structure. The flowers are fragrant.—The synonyms display remarkable changes in the specific name, made by Linnæus himself. We should have preferred *digitata*, not only as given in his most classical work, but as the most expressive, had it been strictly correct; the leaves however are not truly digitate, but merely divided in a fingered manner, and not more so than in *cerulea*, n. 51. The young ones have sometimes but three lobes, though five or seven ribs. The stipulas are small, half-pinnatifid, as in *filamentosa*, n. 52.

54. *P. pedata*. Curled Passion-flower. Linn. Sp. Pl. 1360. Ait. n. 21. Cavan. Diff. 462. (*Clematis indica alia polyphylla*, flore crispato; Plum. Amer. 66. t. 81.)—Leaves pedate, of seven serrated acute leaflets. Bractæas

distinct, serrated. Rays twisted.—Found by Plumier, by the road side near Miragoan in Hispaniola, and no where else. The shoots are somewhat angular. Leaves remarkable for being pedate, as in *Helieborus niger*, consisting of seven, almost entirely distinct, elliptic-lanceolate, acute, single-ribbed, sharply serrated leaflets, of a fine shining-green, the central one three or four inches long. Footstalks rather long, with a pair of glands in the middle. Stipulas not represented. Flowers surpassing all the rest, according to Plumier, in size, fragrance, and brilliancy of colours. Bractæas large, ovate, acute, concave, very sharply jagged and serrated at the edge. Calyx pale green, dotted on the inside with red. Petals blue. Rays in one principal row, spreading, longer than the petals, deep red, with two or three white bands, their extremities of a fine violet, tapering, zigzag, and twisted. Column, stamens and styles white, speckled with red. Stigmas divided. Fruit globose, like a small gourd, the size of a moderate apple, speckled with shades of green.—Mr. Masson is recorded as having sent this noble plant to Kew in 1781, from the West Indies, but there is no account of its flowering, and we fear it is now lost.

55. *P. heterophylla*. Various-leaved Passion-flower. Lamarck, n. 32. Willd. n. 46. Cavan. Diff. 462. (*Granadilla heterophylla*, flore albo; Plum. Ic. 129. t. 139. f. 1.)—Leaves pedate, of five, nearly entire, abrupt leaflets; the lower ones linear, ternate or simple. Rays straight.—Gathered by Plumier, near a rivulet in the fourth part of Hispaniola, flowering and fruiting in September. Lamarck. This is the most remarkable of all, for the difference between the lower leaves, which are long, very narrow, undivided, and entire, either simple or ternate, and the upper ones, which are pedate, of five broad, short, abrupt, entire, sometimes slightly lobed leaflets, an inch or two long. Flowers yellowish-white, scarcely above an inch wide, their calyx horizontal and flat, twice as long as the rays, the petals being of an intermediate length between both. Fruit oval, rather bigger than an olive, deep violet, full of violet juice. Nothing is known of the bractæas.—This singular species approaches in foliage to the last, in flower to *lunata*, n. 17, and in fruit to *suberosa* and its allies. No other botanist than Plumier seems to have met with it, nor is it known in the European collections.

The scientific botanist who contemplates the above view of this interesting genus, will perceive that it has many claims to be considered as a natural order, requiring subdivision into several genera. This task will at first appear easy, as nothing can be more striking than the difference of structure in the *nectaries* of several species, nor are the tubular calyces of others less remarkable. On a further inspection, however, more and more difficulties will arise. The calyx is tubular in various species, otherwise very unlike, and flat in others, no less dissimilar among themselves. The minuteness of the rays in some of the *Tacsonia* of Jussieu, loses its importance when we consider the several new species in the fifth volume of Cavanilles' Icones. The bractæas, which Cavanilles reckons a calyx, and on the absence or presence of which, as well as their union or separation, he forms his subdivisions of the genus, are of all things most improper, even for that purpose, and lead to a less natural arrangement than the leaves themselves, which last we have followed, from necessity rather than choice, after the example of Linnæus, Lamarck, and Willdenow. The want of petals collects several species into a most natural assemblage, but others, as *orbiculata* and *peltata*, for instance, totally overlook the authority of that character. A minute and regular investigation of all their *nectaries*,

such as Mr. Sowerby has bestowed upon six species, in the second volume of the Transactions of the Linnæan Society, might throw considerable light upon the subject, but is not to be undertaken without a great variety of specimens, either fresh, or preserved in spirits. It is much to be regretted that these fine plants have received so little attention from our periodical authors, to whose pages many of them, easily to be procured, would prove a great accession. S.

PASSIFLORA, in *Gardening*, contains plants of the herbaceous and shrubby flowering kinds, of which the species cultivated are: the common or blue passion-flower (*P. cærulea*); the rose-coloured passion-flower (*P. incarnata*); the yellow passion-flower (*P. lutea*); the notch-leaved passion-flower (*P. ferratifolia*); the apple-fruited passion-flower (*P. maliformis*); the square-stalked passion-flower (*P. quadrangularis*); the wing-stalked passion-flower (*P. alata*); the laurel-leaved passion-flower, or water lemon (*P. laurifolia*); the many-flowered passion-flower (*P. multiflora*); the red-fruited passion-flower (*P. rubra*); the moon-shaped-leaved passion-flower (*P. murucuja*); the bat-winged passion-flower (*P. vespertilio*); the round-leaved passion-flower (*P. rotundifolia*); the ciliated passion-flower (*P. ciliata*); the cork-barked passion-flower (*P. fuberosa*); the silky-leaved passion-flower (*P. holosericea*); the glaucous-leaved passion-flower (*P. glauca*); and the dwarf-leaved passion-flower (*P. minima*).

Of the first sort there is a variety with much narrower lobes, divided almost to the bottom; the flowers come later in the summer; the petals are narrower, and of a purer white colour.

It is observed, that if the seventh sort does not equal the first in elegance, it exceeds it in magnificence, in brilliancy of colour, and in fragrance, the flowers being highly odoriferous.

Method of Culture.—In all the sorts it is either by seeds, layers, or cuttings, according to the kinds.

The first or hardy sort is capable of being raised either by seeds, layers, or cuttings; the seed should be sown in the early spring, as March, in large pots, half an inch deep, either plunging them in a warm border, and as the weather becomes warm moving them to the shade; or in a hot-bed, which will forward the germination of the seed more fully, and the plants will rise sooner; which should afterwards be hardened gradually to the open air till the autumn, and then placed under a garden frame for the winter, to have shelter from frosts, and in the spring planted out in pots, or some in the nursery; and in a year or two they may be transplanted where they are to remain, against some warm south wall.

The layers should be laid down from some of the branches in the common way in the spring, when they will readily emit roots, and make proper plants by autumn; when, or rather in the spring following, they should be taken off and transplanted either into pots in nursery rows, or where they are to remain.

The cuttings should be made in February or March, from the strong young shoots, in length from about eight to ten or twelve inches, planting them in any bed or border of common earth, giving frequent watering in dry weather, and when sunny and hot, if in a situation exposed to them, a moderate shade of mats will be of much advantage. They will emit roots at bottom, and shoots at top, and become good plants by autumn, allowing them the occasional shelter of mats, &c. during the winter's frost; and in the spring let them be planted out. If a quantity of these cuttings be planted close, and covered down with hand-glasses, it will forward their rooting; observing, however, when they

begin to shoot at top, to remove the glasses, in order to admit fresh air.

The second and third, or green-house kinds, may be increased by seed, layers, and parting the roots; the seed, obtained from America, should be sown in pots in March or April, plunging them in a hot-bed to raise the plants, which afterwards inure to the open air in summer, giving them the shelter of a green-house or frame in winter; and in the spring following plant some out in pots, placing them among the green-house plants; and others may be planted in the full ground, under a warm fence, to take their chance.

The layers should be made in the summer from young shoots, which will readily grow, and become good plants for potting off in autumn. The parting the roots should be done in spring, before they begin to shoot. The second sort multiplies exceedingly by its creeping roots; which should be divided into slips, and planted in a bed of rich earth till autumn, when some should be transplanted into pots for occasional shelter in winter.

All the more tender stove kinds are capable of being increased by seeds, layers, and cuttings; the seeds are procured chiefly from abroad; and should be sown in spring in pots, plunging them in a hot-bed, or in a stove bark-bed; the plants soon appear, which, when three inches high, should be pricked out in separate small pots, giving water, and re-plunging them in the hot-bed, occasionally shading them till rooted; as they advance in growth, they should be shifted into larger pots, and be retained constantly in the stove.

The layers should be made from the young branches in the spring or beginning of summer, which will readily grow, and be fit to pot off separately in autumn.

The cuttings should be made in the spring or summer, from the young shoots, planting them in pots, plunging them in the bark-bed, and giving water frequently; when most of them will take root, and be fit to pot off singly in autumn.

In respect to their general culture; as in severe winters, in the first sort, the branches, if not duly protected, are sometimes killed, it is advisable at such times, whilst the plants are young in particular, to give them the shelter of mats during the inclement season, and protect their roots with dry litter laid over the ground; carefully uncovering their branches as soon as the frost breaks; this covering, however, is only necessary in very severe frosts.

The green-house sorts should generally be potted, to move to shelter in winter, either in a green-house, or deep garden-frame; some plants of each sort may also be planted in the full ground, in a warm border, to take their chance; covering the ground over their roots in severe weather; and in the different orders of planting, placing stakes for the support of their climbing growth in the summer. And all the stove kinds must constantly be kept in pots, placed in the stove, and for the most part plunged in the bark-bed; placing strong stakes for the purpose of training the branches to, and managing them as other stove plants of a similar growth. See *STOVE-Plants*.

The first sort is highly ornamental in the open ground, when trained against southern walls, &c.; and those of the green-house, and stove kinds, among other plants in these collections.

PASSIGNANO, in *Geography*, a town of Italy, in the Perugian, on the N. side of the lake; 22 miles N.W. of Perugia.

PASSING-NOTES, in *Music*. This is a subject so well treated by Dr. Pepusch, in his Treatise on Harmony, that we shall do little more than transcribe his rules.

After giving instructions for preparing and relieving regular discords, he says, we will now shew how discords may be used without being prepared, particularly by suppositions; but then they are no longer to be called discords, but *passing* or *transient notes*.

In diminutions or divisions, all the notes that are not to be found in the chord upon which the passage is built, are called *passing notes*. Passing notes must be used in a regular ascent or descent, not by leaps, or wide intervals. See in *Music Plates* examples of passing notes selected from Pepusch.

PASSING-Places, are wider places than the ordinary breadth of some canals, for boats to lie in, while others pass, and to turn in, &c.

PASSING-Tickets, or *Permits*, are notes or checks which the toll-clerks on some canals give to the boatmen, specifying the lading which they are found to have on board.

PASSION, *PASSIO*, *παθος*, or *παθημα*, is applied to the different motions and agitations of the soul, according to the different objects that present themselves to the senses. In propriety, all those motions, whereby the soul is carried towards any thing; as love, ambition, revenge, &c. are rather actions than passions.

Those motions, by which the soul finds itself interrupted in its actions, as grief, &c. are the only real passions.

We find various modifications and impressions of pleasure and pain inseparably annexed by an established law of nature, to the several judgments we form concerning good and evil: these judgments, with their respective modifications of pleasure or pain annexed, according to the various appearances and relations of the object considered, either as good or evil, present or absent, certain or uncertain, probable or improbable, possible or impossible, and affecting the machine in a certain manner peculiar to such modifications, make what we call the passions.

How, or by what means, this mutual action and communication between soul and body are effected, we are, in a great measure, ignorant: we have but very obscure and faint notions of any thing prior, or more simple, to resolve it into, except the immediate will and agency of the first cause itself.

Malebranche defines the passions to be all those emotions naturally arising in the soul, on occasion of extraordinary motions of the animal spirits, and the blood: in opposition to those motions of the soul, which are common to us with pure intelligences, and which he calls *natural inclinations*.

Though the passions be inseparable from inclinations; and though a man be only capable of sensible love or hatred, because he is capable of spiritual ones; yet does it appear just in that author to distinguish between them? Passions are much stronger and warmer than inclinations; their objects also are different, and so are their causes: in truth, passions and inclinations differ just as much as sense and imagination.

In effect, the passions of the soul are the impressions of the author of nature, which incline us to our bodies, and all things that may be of use to their preservation: natural inclinations are the impressions of the Author of nature, which determine us primarily to love him, as our supreme good.

An ingenious writer has accurately distinguished between our affections and our passions: the former, which we apply indiscriminately to all reasonable beings, may most properly signify the desires and inclinations, founded in the reasonable nature itself and essential to it; such as self-love, benevolence, and the love of truth. These, when aided and strengthened by additional, instinctive determinations, are, properly,

passions. Those tendencies within us, that are merely arbitrary and instinctive, such as hunger and thirst, and the desires between the sexes, we commonly call appetites or passions, indifferently, but seldom or never affections. Price's *Rev. of Morals*, p. 125, &c. For the difference between appetites and passions, see *APPETITE*.

Passion, says another excellent writer, is a kind of medium between a simple affection of the mind, and the appetites and sensations of the body. Passion is an affection of the mind, which distinguishes it from the appetites of the body, hunger and thirst, and from bodily sensations; and it is attended with a peculiar and extraordinary emotion of the animal spirits, by which it is distinguished from pure affection, and from the several sensations; in all which, though there be some motion of the blood and spirits, yet that motion is natural and regular; whereas in the agitation, occasioned by the passions, the spirits are moved after a more vehement and tumultuous manner. Grove's *System of Moral Philosophy*, vol. i. chap. 7.

Dr. Cogan, who merits a place among other approved authors on this subject, observes, in his "Philosophical Treatise of the Passions," that one or other of the three terms, passion, emotion, affection, is always employed to express the sensible effects which objects, or ideas concerning them, have upon the mind; but these terms are so frequently employed in a vague and indeterminate manner, that some difficulty attends the attempt to restore them to their precise and discriminating signification. Accordingly the word *passion* is rendered subject to several peculiarities in the application of it. Sometimes it is used, in a generic sense, as expressive of every impression made upon the mind, whether they be weaker or stronger. In one instance the word is emphatically employed to express "suffering," as "our Saviour's passion;" in another it indicates "anger" exclusively. Sometimes the term "passion," and also its adverb "passionately," express a very strong predilection for any pursuit, or object of taste; a kind of enthusiastic fondness for any thing. In a sense similar to this the word is also applied to every propensity, which operates strongly and permanently upon the mind; as the *selfish* passions, the *generous* passions. Yet when we mean to particularize any of these, a different phraseology is used. The word "passion" is appropriated to the *evil* propensities which are uniformly operative. Thus, we do not say the "affection" of pride, or of avarice, but the "passion." The term "affection," on the other hand, is appropriated to the *virtuous* propensities; as the *social*, *friendly*, *parental*, *filial* affections, &c.; though, philosophically considered, the relation they bear to the state and workings of the mind is perfectly analogous. This latitude of expression is not confined to the language of the vulgar, but it is obvious even among philosophers, who are not agreed in their ideas of the terms they employ. The controversy between the ancient Peripatetics and the Stoics, with regard to the passions, was probably owing to their affixing different meanings to the word. The one sect maintained, that the passions are good, and useful parts of the constitution, while they are held under the government of reason. The other sect, conceiving that nothing is to be called passion, which does not, in some degree, becloud and darken the understanding, considered all passion as hostile to reason, and therefore maintained, that, in the wise man, passion should have no existence, but be utterly exterminated. One sect considered passion only as the cause of those bad effects which it often produces. And the other considered it as fitted by nature to produce good effects, while it is under subjection to reason; but both allowed, that no dictate

of passion ought to be followed in opposition to reason. Their difference therefore was verbal more than real, and was owing to their giving different meanings to the same word. The precise meaning of this word seems not to be more clearly ascertained among modern philosophers. Mr. Hume gives the name of "passion" to every principle of action in the human mind; and consequently maintains, that every man is and ought to be led by his passions, and that the use of reason ought to be subservient to the passions.

Dr. Hutcheson, considering all the principles of action as so many determinations or motions of the will, divides them into the calm and the turbulent. The turbulent, he says, are our appetites and our passions. Of the passions, as well as of the calm determinations, he says, that some are benevolent, others are selfish; that anger, envy, indignation, and some others, may be either selfish or benevolent, according as they arise from some opposition to our own interests, or to those of our friends, or persons beloved or esteemed. It appears, therefore, that this excellent author gives the name of passions, not to every principle of action, but to some; and to those only when they are turbulent and vehement, not when they are calm and deliberate. This view of the subject coincides with Cicero's translation of the Greek word *παθος*, which he renders by *perturbatio*. It is evident, says Dr. Reid, that this meaning of the word "passion" accords much better with its common use in language, than that which Mr. Hume gives it.

When he says, that men ought to be governed by their passions only, and that the use of reason is to be subservient to the passions, this, at first hearing, appears a shocking paradox, repugnant to good morals and to common sense; but, like most other paradoxes, when explained according to his meaning, it is nothing but an abuse of words. For if we give the name of "passion" to every principle of action, in every degree, and give the name of "reason" only to the power of discovering the fitness of means to ends, it will be true, that the use of reason is to be subservient to the passions.

Dr. Reid, adverting to the use of words in common language, means by the word "passion," not every principle of action distinct from those desires and affections which he had previously explained (see the terms DESIRE and AFFECTION), but such a degree of vehemence in them, or in any of them, as is apt to produce those effects upon the body or upon the mind of which we have already taken some notice, and which will be further considered in the sequel of this article.

According to the statement of Dr. Cogan, the primary idea annexed to the word "passion" is that of *passiveness*, or being impulsively acted upon. In this sense the term properly signifies the sensible effect, the feeling to which the mind is become subjected, when an object of importance suddenly and imperiously demands its attention; and as several of our passions are of a disagreeable and powerful nature, and as this passive or helpless state is so frequently connected with *suffering*, the transition from one signification to the other is not only natural but unavoidable; and a passion will often be considered as synonymous with suffering. Upon the whole, the mind is equally passive in every effect suddenly and unexpectedly produced upon it, whether its influence be of a pleasant, or unpleasant nature. Accordingly this writer observes, that the term "passion" may, with strict propriety, be used, and used exclusively, to represent the *first feeling*, the *percussion* as it were, of which the mind is conscious from some impulsive cause, by which it is wholly acted upon without any efforts of its own, either to solicit or escape the impression. For the difference be-

tween passion and emotion, see EMOTION; and between passion, emotion, and affection, see AFFECTION.

Writers on this subject have differed very much in their arrangement or classification of the passions. The ordinary distribution is into passions of the *concupiscible appetite*, which are pleasure and pain, desire and aversion, love and hatred; and those of the *irascible appetite*, which are anger, courage, fear, hope, and despair. See the authors on the subject of the passions; Des Cartes, who considers them physically; Coeffeteau, who gives us the tableau, or picture of the passions; La Chambre, the characters of the passions; Senault, the uses of the passions; and Hutcheson, Watts, and others, who consider them in a moral and religious view.

Some authors have placed the passions in contrast to each other, as hope and fear, joy and sorrow: some have considered them, as they are personal, relative, social: some, according to their influence at different periods of life: others, according as they relate to past, present, or future time; as sorrow refers principally to things past, joy and anger to present occurrences, hope and fear to future events. The academicians advanced that the principal passions were fear, hope, joy, and grief. Thus Virgil:

"Hinc metuunt, cupiunt, gaudentque, dolentque."

They included aversion and despair under the fourth; and hope, fortitude, and anger, under desire. But this arrangement is in some respects too general, and in others defective.

Dr. Hartley has arranged the passions under five grateful and five ungrateful ones. The former are love, desire, hope, joy, and pleasing recollection: the latter are hatred, aversion, fear, grief, displeasing recollection. To this classification it has been objected, that all these cannot be considered as cardinal passions; nor do the distinctions themselves appear sufficiently accurate; hope is certainly a species of desire; pleasing recollection is a modification of love; aversion is only a particular manner of testifying hatred; and displeasing recollections are sometimes the renewal of grief, sometimes of anger.

Dr. Watts has distinguished the passions into two classes, *viz. primitive and derivative*. The primitive passions he subdivides into two ranks: 1. Admiration, love, and hatred. 2. The diverse kinds of love and hatred, as esteem, contempt, benevolence, malevolence, complacency, displacency. The derivative passions are desire, aversion, hope, fear, gratitude, anger, &c. Thus, if an object be rare or uncommon, either in its kind or qualities, it excites our admiration or wonder: if such an object is presented to us in a sudden and unexpected manner, the passion is called surprise; and when our wonder rises to a high degree, it is called astonishment. Moreover, admiration, according to the different character of its object, is denominated esteem or contempt; though some writers make esteem and contempt to be particular species of love and hatred. Esteem is the admiration of an object, on account of its excellence, contempt, for its insignificance or worthlessness; whence proceed veneration, and slight or scorn.

If we look on any object as good, or in any respect agreeable to us, it may engage our love; but if it be evil or disagreeable, it excites our hatred, or an endeavour of the soul to disunite itself from the apprehended evil. When the evil is present, it produces grief, and a desire of its removal; this desire of escaping an evil may be considered as solitary, without desiring it may befall another person, in which case it is called aversion; but when accompanied with such a desire, it is denominated malevolence. The ancient

philosophers meant much the same by their *ἐπιθυμία καὶ βόμω*, the concupiscent and the irascible part.

To this arrangement, it has been objected, that admiration has not an equal title to be considered as a primitive passion with love and hatred. Besides, a subdivision of the primitive into two ranks creates a suspicion, if it do not fully indicate, that they cannot all be equally primitive; and the instances given under the second rank may justly be considered as different modifications of the two grand principles, and not as primitives of a distinct character. Moreover, this plan makes no distinction between the passions and affections, which the nature of the subject not only admits, but requires.

Mr. Grove, adopting in part the arrangement of Dr. Watts, reduces all the passions to the three heads of admiration, love, and hatred, which he styles accordingly the primitive passions: the others he denominates mixed passions, of which some have admiration blended with them, and others are compounded only of the passions which fall under love and hatred. Those passions, in which admiration is a principal ingredient, are ambition, glory (made up of joy, self-love, and esteem), shame (compounded of sorrow, self-love, and contempt), emulation, horror, and consternation. The other passions, compounded of love and hatred, may be distributed into such as more immediately regard ourselves, and such as have others for their objects: of those which concern ourselves, the principal are the following, *viz.* fluctuation, consisting of desire and grief; resolution, hope, fear; security, which is hope advanced beyond the fear of a disappointment; despair, which is fear without any mixture of hope; jealousy, and disgust. Of those which express our dispositions towards others, the chief are the following, *viz.* irritation, or that mirth which is excited in us by the sight of another's absurdities or misfortunes; commiseration, which is a compound of love and sorrow; congratulation, or that joy which our love to another makes us receive from the gifts of nature or Providence bestowed upon him; envy, anger, gratitude, and that which the Latins call *desiderium*, or fondness for the memory of persons and things that have been greatly beloved by us, springing from the reflection on a past good, which we despair of enjoying again.

Dr. Cheyne considers the passions as either spiritual or animal. *Spiritual* passions he defines to be those sentiments produced in the soul by external objects, either spiritual ones, immediately; or material ones, by the mediation of the organs of the body.

Animal passions he defines to be those effects produced by spirits, or bodies, immediately on the body.

Hence, as outward objects may be considered either as goods or evils, the most natural division of the passions, whether spiritual or natural, as they regard those objects, is into *pleasurable* and *painful*.

And, in this sense, all passions may be reduced to love and hatred; of which joy and sorrow, hope and fear, are only so many modifications or complexions, according to the various appearances, positions, &c. of the object.

In effect, all the passions may not only be reduced to two, *viz.* love and hatred, but, perhaps, to one, love; and even that may be all resolved into self-love; and this into a principle of self-preservation, or necessary invincible desire of pleasure and happiness. The rest are only rivulets from this source, or special applications of this principle to particular occasions.

Thus, the desire of any thing, under the appearance of its goodness, suitableness, or necessity to our happiness,

constitutes the passion of love; the desire of eschewing or avoiding any thing apprehended to be mischievous, hurtful, or destructive, constitutes hatred or aversion; the desire of a good, which appears at the same time probable, and in our power, constitutes hope; but, if the good appear improbable, difficult, or impossible, it constitutes fear or despair; the unexpected gratification of desire is joy; the desire of happiness to another under pain, or suffering, is compassion; and the desire of another's punishment, is revenge or malice, &c.

The single desire of happiness, then, is the spring or motive of all our passions, as those are of all our actions. Some wise and reasonable motive, or end of action, says Dr. Morgan, is certainly necessary to all wise and reasonable action: to act without a motive, would be the same thing as not to act at all, that is, such an action could answer no farther or better end than not acting; and consequently the action, as well as the agent, would be so far insignificant and useless. He, who should have no object at all of his love or aversion, hope or fear, joy or grief, must be simply and purely indifferent to all action; and, consequently, he must either be in a state of perfect rest and inaction, or in a state equivalent thereto; wherein the action of such a being could be of no more signifiçancy than the uncertain fluctuation of an atom, or the quivering of a feather in the air.

But we can by no means approve the opinion of those, who will allow no ultimate object of desire, or motive to action, besides private good. It is justly observed by a writer already cited, that this opinion sprung from not carefully distinguishing between desire, and the pleasure implied in the gratification of it. The latter is subsequent to the former, and founded in it; that is, an object such as fame, knowledge, or the welfare of a friend, is desired, not because we foresee, that, when obtained, it will give us pleasure, but *vice versa*; the obtaining it gives us pleasure, because we previously desired it, or had an affection carrying us immediately to it, and resting in it. And if there were no such affections, the foundations of private enjoyments and happiness would be destroyed. Of our several passions and appetites, some are subordinate to self-love, and given with a view to the preservation and welfare of individuals; others are subordinate to benevolence, and given in order to secure and promote the happiness of the species; and both the one and the other are essentially distinct parts of our intelligent frame. Price's Rev. p. 127, &c.

Dr. Cogan, in the Treatise already cited, having expressed his dissatisfaction with any of the arrangements of the passions which he has had occasion to consider, proposes another classification, which he conceives to be less liable to objections. Of this he has given an ample detail, in which our limits will not allow us to follow him. We shall, however, give as concise, and at the same time as satisfactory, an account of it as possible. He begins with stating, that it is essential to the nature of every sensitive and intelligent being to be gratified with, or delight in, "well-being." This well-being is an essential good, and its opposite an essential evil. Whatever is productive of this desirable state, we esteem as *good*; and we characterise as *evil*, whatever is inimical to it. Under the impression of this sentiment, we indulge a *predilection* for the one, and feel an *abhorrence* of the other. Upon that which we deem to be a good, or conducive to happiness, we look with a *pleasant* sensation: we deem it desirable, and it inspires the affection of "love." Whatever occasions or threatens a privation of happiness, or inflicts positive misery, we view with displeasure, and regard as injurious, or as an absolute evil; and it inspires the affec-

PASSION.

tion of "hatred." "Love" and "hatred" are entitled to the denomination of *primary* or *cardinal* affections.

"Love" may be considered either as a principle or as an affection. As a principle, it may be defined "an invariable preference of good; an universal and permanent attachment to well-being or happiness." When this principle is directed to any particular good, it becomes an *affection*; and whenever this love is more violent in its effects upon the system, it is even deemed a *passion*. When the affection of love immediately relates to *ourselves* personally, it is called "self-love." When our love or desire of good goes forth to others, it is termed "good-will," or "benevolence." When love extends to the whole human race, it is termed "philanthropy." And when the love of benevolence embraces all beings capable of enjoying any portion of good, it becomes *universal* benevolence. When the dispositions springing from this source are acting principally towards every thing capable of enjoyment, they are called the *benevolent affections*: and as these become, in those who indulge them, operative rules of conduct, or principles of action, we speak of the *benevolent principle*.

"Hatred" expresses the disposition we entertain concerning, or the manner in which we are affected by, the contemplation of whatever we suppose to be *evil*. Hatred of misery, and its causes, is a natural and necessary consequence of our solicitude to possess good. Personal hatred, or malevolence towards an individual, commences with some circumstance, quality, or disposition, which is displeasing to us, or with some species of injury committed or intended. These are its professed objects. But notwithstanding the excesses and exaggerations of hatred and malevolence, yet they cannot possibly be so extensive in their operations as the principle of love; because the affection of hatred has for its objects only particular and partial evils, while the principle of love may embrace the universe.

With the affections of love and hatred are intimately connected those of desire and aversion. As love and hatred may be resolved into that one principle, "the love of well-being;" the affections of desire and aversion may be resolved into "desire." After these preliminary remarks, and others on those introductory emotions which produce *surprise*, *wonder*, and *astonishment*, the author proceeds to develop his plan of the arrangement of the passions.

CLASS I. comprehends the passions and affections which owe their origin to the principle of "self-love."

This class includes two distinct orders, *viz.* that in which "love," and the "idea of good," that is, something either beneficial or pleasant, are more immediately present to the will; and that in which "hatred," and the "idea of evil," are most impressive. The *first order* comprises two kinds; the one relating to good in *possession* the other to that in *expectation*. The first kind inspires *joy*, *gladness*, which is an inferior degree of joy, *cheerfulness*, or an emotion of still gentler influence, *nirrh*, or a higher degree of cheerfulness, *contentment*, *satisfaction*, and *complacency*. The latter affection of complacency has its counterfeit; and false conceptions of our own talents, a requirements, and conduct, may inspire *pride*, *vanity*, *haughtiness*, and *arrogance*. The second division under this order comprehends *desire* and *hope*. A *wish* is an inactive desire. As the above passions and affections are inspired by the contemplation of good, they are most of them of a *pleasant* nature.

The *second order* comprehends those passions and affections operating upon the principle of "self-love," in which the idea of *evil* is present to the mind. Of these there are three kinds, the *first* relates to actual losses and disappointments:

the *second* to evils of which we are apprehensive: and the *third*, to the conduct which seems to deserve reprehension. These inspire the passions of *sorrow*, *fear*, and *anger*, with their different modifications and combinations. *Sorrow* sometimes assumes the appearance of *discontent* and *dissatisfaction*. *Impatience* is a mixture of sorrow and anger: *repining* is sorrow united with a degree of resentment against some superior agent, where the mind cannot burst forth into strong expressions of anger; and *sympathetic sorrow* is that which we participate with others, in consequence of our social connections, or the general benevolence of our nature. (See SYMPATHY.) Of the virtuous affections inspired by sorrow, which are personal, the most conspicuous are *patience*, *resignation*, and *humility*. *Fear* is a painful sensation produced by the immediate *apprehension* of some impending evil. The modifications of this passion are *consternation*, *albeit* fear, and *terror*. The affections, that is, the more permanent impressions of fear, unaccompanied with external signs: characteristic emotions, are *dread*, *despair*, *remorse*, *cowardice*, *pusillanimity*, *timidity*, *doubt*, *irresolution*, *shame*, *modesty*. The affections and dispositions opposed to fear, are *fortitude*, which expresses that firmness of mind that resists dangers and sufferings; *courage*, which is active fortitude; and *intrepidity*, expressing a courage perfectly undaunted, or a superiority to the very sensation of fear. The third strong effect produced by the immediate perception of evil, is *anger*. Anger, in the excess of its violence, is termed *rage*; *wrath* is violent and permanent anger, and as such it may be denominated an affection: *resentment* is a lesser degree of wrath; *indignation* is resentment against a conduct that appears peculiarly unworthy. Although anger, and its principal ramifications, are generally directed against the conduct of others, they are sometimes directed against ourselves, when our conduct has been either negligent or criminal. In *repentance*, *contrition*, and *remorse*, self-reproach, and even *indignation*, are largely intermixed with the affection of sorrow. *Vexation*, *chagrin*, and *impatience*, do not relate to persons so much as to particular circumstances of a teasing nature. *Peevishness* may be considered as a lighter degree of anger perpetually recurring to irritable persons from trifling causes. Fortitude, courage, and intrepidity, which have been referred to *fear*, might, without impropriety, have been placed under the passion of *anger*.

CLASS II. comprehends the passions and affections derived from the "social principle." The social principle extends its regards to the state, the conduct, and the character of others. No one general term is adapted to all those passions and affections which belong to this principle. Dr. Hartley, however, has comprehended them all under the name and character of "sympathy;" which he divides into four classes; rejoicing at another's happiness; grieving at his misery; grieving at his happiness; and rejoicing at his misery. But the word sympathy, whether we advert to its genuine import or common usage, is ill adapted to the two last divisions. The usual idea of sympathy is that of suffering with another, which is the most opposite possible to grieving at his happiness, or rejoicing at his misery. These two opposite dispositions are usually expressed by the opposite terms *benevolence* and *malevolence*. The first referring to kindly dispositions towards its objects, and the other to the reverse: yet these terms are not wholly unexceptionable, as they do not always convey ideas perfectly correspondent with the various differences comprised under these general heads. Instead of malevolence, Dr. Cogan substitutes *displacement* as a generic term.

The second class is divided into two orders. The *first order* includes passions and affections excited by benevolence, in

in which *good* is the predominant idea. Of these there are the following kinds. 1. Those which respect benevolent *desires* and *dispositions*. Of those which respect *distresses*, the principal are *compassion, mercy*, which is the most exalted branch of compassion, *commiseration, condolence, pity, generosity, liberality, charity*, and *condescension*. Another important branch of benevolence consists in partaking of the good fortune of others; in the participation of their joy, upon the accession of good or liberation from evil. The immediate expressions of our joy are denominated "congratulations." 2. The affections derived from *good opinion*. Of these the most conspicuous are *gratitude, admiration, esteem, respect, veneration, awe, and reverence*. As self-complacency has its counterfeits in pride and vanity, the complacential affections are liable to abuse, and give rise to the following imperfections, *viz fondness and partiality*.

The *second order* comprises passions and affections excited by *displacency*, in which *evil* is the predominant idea. Of this order there are two kinds. 1. The displacency which is indicated by *malevolent desires and dispositions*. The first species of malevolence is a branch of the general principle of hatred. To this kind belong *malignancy or malignity, malice, envy, rancour, cruelty, censoriousness, prejudice, ingratitude, and apathy*. The second species of malevolence relates to those occasional and more transient fits of ill-will, which are excited by particular provocations, and which are not totally repugnant to the benevolent affections. These are indicated by anger, and its various modifications. Such are *rage, revenge, wrath, resentment, suspicion, and jealousy*. 2. The displacency, which is indicated by *unfavourable opinions* of conduct and disposition; and this gives rise to the following emotions and affections, *viz. horror, indignation, contempt, disdain, and irrision*.

The natural or occasional cause of all the passions, Malebranche makes to be the motion of the animal spirits, which are diffused through the body, to produce and preserve a disposition therein suitable to the object perceived; to the end that the body and mind may mutually assist each other on this occasion, it being the order of the Creator, that our wills be followed by motions of the body proper to execute them; and that the motions of the body, mechanically excited in us by the view of external objects, be accompanied with a passion of the soul, which inclines to will or nill what appears serviceable or noxious to the body.

It is a continual impression of the will of the Creator, that unites us thus intimately to a piece of matter, and occasions this reciprocation of motions and sensations; were this impression of the Creator's will suspended a moment, we should be delivered from all dependence, all passions, &c. For what people usually imagine of a necessary connection between the motions of the spirits and blood, and the emotions of the soul, is wholly inconceivable.

Certain little parts of the bile, say they, move with some violence among the fibres of the brain; therefore, the soul must necessarily be agitated by some passion, and this passion must be anger rather than love. What relation can we conceive between the faults of an enemy, a passion of contempt or hatred, and a bodily motion of the parts of the blood striking against certain parts of the brain? How can the union or alliance of two things so different as spirit or matter be effected, but solely by the omnipotent will of the Author of nature?

Dr. Cogan observes, that the essential and characteristic difference between a passion and an affection depends upon the super-addition of surprise to the natural effect produced by the real or supposed quality of an object, and that this emotion,

conjoined with the specific nature of its *exciting cause*, is virtually the *efficient cause* of a passion; the percussive rendering the affection visible by characteristic signs, correspondent with its specific nature. This observation is exemplified in the passions of joy and anger.

There has been much controversy about the seat of the passions; whether it be in the spiritual, or in the animated material part of man. Some philosophers place the passions solely in the corporeal system; among these was the celebrated Descartes: but when we consider, says Mr. Grove, that passion signifies a sensation of the soul, it must be lodged there, and not in any part of the body. As this sensation is joined with a tumult or agitation of the spirits, the passion must go along with the spirits moved. Those in admiration, which seems to be a more speculative passion, on being employed chiefly about the novelty or grandeur of objects, are in the brain, the great instrument or condition rather of thought and contemplation. In other passions, which, respecting the good or evil of objects, proceed from a principle of self-preservation, the spirits agitated are in the heart, the fountain of life, and sitest residence of those motions of the animal spirits, which are intended for the benefit and preservation of life.

Others again ascribe some of the affections to the animal principle, and some to the rational. Dr. Reid doubts whether the principle of esteem, as well as that of gratitude, ought to be reckoned in the order of animal principles, or if they ought not rather to be placed in a higher order. He has, however, finally placed the esteem of the wise and good in the order of animal principles, though the same affection is sometimes placed by this philosopher under the animal, and sometimes under the rational principle. Speaking of resentment he observes, that sudden or instinctive resentment is an animal principle, common to us with brute animals; but that resentment, which some authors call deliberate, must fall under the class of rational principles. He also excludes parental affections from the rational principle, because it is not grounded on an opinion of merit in the object. (See his *Essays on the Active Powers of Man*, *ess. iii. chap. 4.*) This embarrassment of Dr. Reid seems to arise from the expectation that the rational principle must always act rationally; which leads him to infer that whenever the passions and affections do not receive the sanction of reason, they are to be assigned over to the animal principle. But this hypothesis would tempt us to doubt of the very existence of the rational principle, in numbers of our species; it leads us to conclude that the two natures, deemed so diametrically opposite to each other, possess powers so perfectly similar, that it is difficult for the keenest discernment to distinguish between their operations; and it compels us to infer, that whenever some of our affections become conformable to reason, they have changed their seat from the animal to the rational principle.

Philosophers and divines, who distinguish man into the three constituent parts of body, soul, and spirit, which, notwithstanding the intimacy of their union, they suppose to be different in their natures, ascribe the appetites to the body, the passions and affections to the soul, and to the spirit those intellectual powers which seem remote from passions or emotions of any kind. But if the affections pertain to the soul exclusively, that alone is capable of *enjoying*: the spirit is deprived of every motive for speculation; and since it sometimes happens that speculations of the most abstruse kind excite pleasing sensations, the spirit must certainly *perceive*, though it has no faculties to *lament* its hard lot, as often as it is conscious, that these delightful sensations, which are its own work, are transferred to the soul. After all,
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PASSION.

it must be admitted, that every passion, emotion, and affection, proceeds from certain impressions or ideas excited concerning the nature, or state, or quality, or agency of the exciting cause. These ideas have undoubtedly their seat in that part of man which we distinguish by the appellation of *mind*. The exciting cause, therefore, changes the state of the mind respecting the particular object. From total indifference it becomes some way or other *interested*. This impression, if it be possessed of a certain degree of strength, produces a correspondent change upon the body. Universal observation, and universal phraseology, which is doubtless founded upon this observation, unite to evince that a very perceptible influence of every strong emotion is directed towards the *heart*. The heart experiences various kinds of sensation, pleasant or unpleasant, over which it has no controul; and from thence the influence of agitated spirits seems to be diffused over the body. This state of mind is styled an *affection*, and it appears to be totally mental; but stronger influences produce such changes, that the inward disposition becomes obvious to the spectator, through the medium of the corporeal frame. It is now called an *emotion*, and this may increase in strength, until the whole system becomes agitated and convulsed. From this statement it appears incontestible, that the affections and passions have their origin in the mind, while emotions are corporeal indications of what passes within, according to the conjecture of Mr. Grove above mentioned.

It is a point, about which the divines and philosophers can never agree, whether this relation and connection of thoughts of the mind, and motions of the body, be the gift of nature, or the punishment of the first sin; and whether the passions be the institution of nature, or its corruption. Indeed, considering the good and wise purposes the passions serve, with regard to knowledge, virtue, and happiness, and their absolute necessity, it is surprising it should ever be doubted that they are essential to human nature.

This union or relation is found in all men, but in different degrees, and of different extent, according to the different temperaments, conditions, ages, sexes, occasions, objects, &c.

In every passion there may seven things be distinguished: the first, the judgment the mind makes of an object, or the view of the relation which the object bears to us. The second, a new determination of the will towards that object, supposing it to appear as good or evil. The third, the peculiar sensation of modification, which accompanies them; as the sensation of love, hatred, desire, or joy, which sensations are always different in the different passions, and are, at it were, the characteristics of them. The fourth, a new determination of the course of the blood and spirits towards the several parts of the body: before the sight of the object of the passion, the animal spirits were pretty equally diffused throughout the body; but the presence of the new object disturbs the whole economy; and the greatest part of the spirits is sent into the muscles of the arms, legs, face, &c. The fifth is, the sensible emotion of the soul, which finds itself shaken by this sudden overflowing of spirits. The sixth is, the different sensations of love, hatred, &c. caused, not by the intellectual view of good or evil, but by the different shakes or movements the animal spirits occasion in the brain. The last is, a certain sensation of joy, or an inward satisfaction, which detains the soul in its passions, and attends its being in the state it ought to be in with regard to that object.

The influence of the affections and passions has been the subject of copious discussion; and it may be considered in three different points of view: as, to the *physical*, or medical

influence of the passions, (for which see the next article,) their *metaphysical*, or influence upon the train of our ideas, correspondent language, &c. and their *moral*, or influence upon character and happiness.

The influence of the passions on thoughts and language is a matter of universal experience and observation. When any subject presents itself to the mind, with sufficient force to excite a passion, or very strong affections, all the powers of the imagination become immediately active, the whole soul is engaged upon its object, and the whole train of ideas is turned into a channel correspondent with the view we entertain of them. This state of mind not only manifests itself by gestures, looks, and tones correspondent with the nature of the passion, but it has a characteristic influence upon the language and expressions employed to give vent to the passion, as it is emphatically termed. Upon the first impulse, the thoughts are tumultuous and confused; but as the *passion* approaches somewhat nearer to an *affection*, the mind recovers in some degree its power over itself; though still, as it continues to feel strongly, it is eager to do justice to its feelings, by the strength, pertinency, and impetuosity of its language. Impetuosity equally despises precision or detail. It eagerly seizes upon tropes and figures the most concise, and the most suited to its new conceptions. When passions and emotions give place to more permanent affections, language becomes less vehement and more diffuse. Nature has accommodated the mode of utterance to the character of the passion; thus it has rendered joy loud and vociferous, producing strong exclamations mixed with triumphant laughter. Sorrow communicates a plain-tiveness to the voice, best adapted to wailings and lamentations. Anger is loud and turbulent; the voice rises with the passion in order to strike terror and silence opposition. Fear is oppressed and breathless, or screams aloud for help. Love is soft, soothing, insinuating, and gentle; sometimes assuming the plaintiveness of sorrow, sometimes the vivacity of hope, and the transports of joy.

The nature of the passions and affections indulged, and of the objects by which they are excited, and the degree of influence and permanency which they are allowed to exert upon us, constitute the moral characters of men; pointing out their innocence, their excellencies, or their defects. By character is generally understood the kind of reputation acquired by the prevalent disposition or temper, which suggests almost every motive, and takes the lead in almost every action; and *moral* character refers to that prevalent temper which relates to moral obligation, respecting either ourselves or others. The cardinal affections of love and hatred, in themselves, possess neither merit nor demerit. It is neither a duty, nor a possibility to divest ourselves of them. The passions, emotions, and affections which are immediately consequent upon these, or may be deemed simple modifications of them, are also inseparable from our nature, and are both unavoidable and innocent: such as joy, satisfaction, contentment, hope, desire, fear, sorrow, anger, resentment, &c. Virtue, however, directs, restrains, and controuls their influence.

There is another distinction of the passions and affections, as they relate to the moral character, indicating a scale of comparative merit and demerit. Some are innocent simply, as hope, joy, moderate grief. Some are laudable, as contentment, satisfaction, complacency. Others are deemed peculiarly noble: thus the virtue of benevolence is much more dignified than any of the affections that originate and terminate in *self*. And in the different branches of this virtue there are also degrees of excellence. But sentiments

of this kind are familiar and obvious to the reader, and it is needless to enlarge. Upon the whole it appears, that character depends upon the prevalent use or abuse of certain propensities or affections of our natures. Those who select and cultivate the most beneficial, are the *best* of characters; those who are habituated to the most injurious, are the *worst*.

With regard to the influence of the passions and affections on happiness, we may observe, that although the desire of good is in reality the cause of every passion, emotion, and affection, yet the immediate effects of each on our sensations are correspondent to its own specific nature. The influence of some is productive of temporary well-being; while others are comfortless, irksome, or productive of a great degree of wretchedness. Love, placed upon a deserving object, and recompensed with a reciprocal affection, joy, ecstacy, complacency, satisfaction, contentment, lively hope, are decidedly sources of personal enjoyment. The social affections of benevolence, sympathy, compassion, and mercy, are also other ingredients of happiness, from a less selfish and more refined source than the preceding. Every species of benevolence possesses the quality our great dramatic poet has ascribed to a merciful disposition.

“ The quality of mercy’s not restrain’d :
It droppeth as the gentle rain from heaven
Upon the land beneath. It is twice blessed ;
It blesses him that *gives*, and him that *takes*.”

Emotions and affections of another class are of the unquiet and irritating class: as the whole family of anger. The emotions and affections of fear, dread, horror, despair, are of the most horrid and tremendous class. Excessive jealousy, envy, remorse, despair, shame, arising from the detection of guilt, are misery unmix'd. Surprise, wonder, astonishment, principally receive their complexion from the subjects that inspire them: and they are introductory to happiness or misery according to the nature of the cause that excites them. For a farther detail, see Cogan’s Treatise already cited.

PASSIONS, in a *Medical View*, constitute one of the six *non-naturals*, as they have been called, and are of great importance, whether considered as a cause of disease, or as exerting a remedial influence when certain diseases exist.

The theoretical discussions of the metaphysicians about the essential distinctions of the mind and the body, have confus’d, rather than elucidated, the subject, and have led to erroneous views of the operations of the animal economy. All that we can know upon the subject, from experience, is, that the living body presents two series of phenomena, one of which comprehends the functions of thought, sensation, volition, and various emotions, which we refer to the mind, and call *mental power*, and the other includes the more mechanical or chemical functions, which resemble the operations produced by inorganized machines, such as digestion, respiration, the circulation of the blood, and the secretions from it, which we deem more strictly *corporeal* functions. Nevertheless we have no actual knowledge of these functions, of either class, except in conjunction, and in that organized form, which constitutes the living body. If the subject be viewed in this light, independently of speculative opinions, it is at once obvious, that these two classes of functions constitute but one whole, and that they are, as far as the physician is concerned, inseparably connected, and mutually dependent upon each other. How extensive this reciprocal influence is, and how powerfully the corporeal functions are modified by those which are called mental, we have taken pains to demonstrate, at great length, in a preceding article. (See IMAGINATION,

Influence of, on the Corporeal Frame.) In common language, we are apt to separate the intellectual faculties from the passions and emotions, and, in compliance with that custom, we ascribed to the imagination simply, the numerous phenomena detailed in the article referred to. But, in truth, the passions were more or less concerned in the production of these phenomena; since the imaginary powers of the agents (as in the case of animal magnetism, &c.) necessarily excited the hopes and fears and anxieties of the persons on whom they operated. Having detailed many proofs, in the article just referred to, of the effects of these emotions, when excited by imaginary agents, upon the corporeal frame; we have now to point out the influence of these emotions, when excited by real and common causes.

The passions have been commonly considered by physicians as of two kinds, in respect to their influence on the state of the body, namely, as *exciting* and *depressing* its vital powers, and consequently as producing analogous effects on the functions. To those which arise from the operation of *stimulant* and *sedative* agents of a material nature. Among the *exciting* passions, are anger, terror, joy, cheerfulness, hope, desire, love, admiration, and the emotions of taste; the *depressing* passions are grief, fear, shame, and anxiety.

It is matter of observation, that the agency of these exciting and depressing emotions in the animal economy, follows the same laws, as that of the material stimulants and sedatives just alluded to. The moderate excitement of the former contributes to the free and perfect performance of all the functions, and therefore to the support of the general health; and debility equally ensues from the immoderate influence of the exciting, and from the direct operation of the depressing causes, which uniformity of effect affords an additional proof of the identity of the living system. The operation of the passions and emotions, both as a cause of health and disease, and also as a remedy in many morbid conditions, is illustrated by the observations of many physiologists and pathologists, and by numerous cases, which have been recorded, as may be seen by consulting the comprehensive and indefatigable Haller. *Elementa Physiologiæ*, tom. v. lib. xvii. p. 580 et seq.

The *exciting passions* have been observed to produce the following effects in the corporeal frame. *Cheerfulness* and moderate *joy* are found to give vigour to the circulation, and to increase the action of the heart and arteries, and consequently to support the vital functions connected with it; they render the respiration easy and free, increase the heat and perspiration, and assist the operations of digestion and of secretion in the various organs of the body; whence the healthy condition of the system is universally promoted. Nevertheless, when the excitement of joy has been excessive and sudden, it has sometimes brought on an acute fever, not unfrequently it has occasioned syncope or fainting, and in a few instances even sudden death. Examples of death thus produced, from an unexpected restoration from imprisonment, from the return of a beloved son, who was supposed to have been dead, or from extraordinary and unlooked for accession of wealth, have been recorded. (See Thoresby, *Nat. Hist. of Leeds*, p. 625. Robinson on the Spleen, p. 91. Nichols, *de Anim. Med.* p. 16.) It were superfluous to repeat the various hypotheses, which different writers have framed to account for these phenomena; as they are altogether gratuitous, or merely statements of the fact, with a change of words. Haller considered the affection as a kind of apoplexy, occasioned by the increased action of the vessels of the brain; but Dr. Cullen appears to have been nearer to the truth, in deeming it the mere result of over-excitement of the nervous system; which is generalizing it to that

that universal law of the animal economy, by which extreme exhaustion invariably follows excessive stimulation. See EXCITABILITY.

The passion of *love*, being a pleasurable emotion, produces effects similar to those of joy. It excites the powers of the mind, as well as those of the body, causes a glow of heat, and an acceleration of the pulse; and, when it is vehement, it excites palpitation of the heart, and a sense of burning heat, through the circulation. The acceleration of the pulse, however, is mostly accompanied with some irregularity, occasioned perhaps by fear and apprehension of the want of success. The love of Antiochus for his step-mother Stratonica, is recorded to have been discovered from the pulse.

The *ardent desire* accompanying *ambition*, or other strong passions, especially if attended with a prospect of success, produces nearly similar effects. So powerful its excitement has been, in some instances, as to have even cured paralytic affections, and roused the body to exertions, far above those to which the strength seemed adequate, and has even protracted death. Muley Moluc, emperor of Morocco, who was wearing away under an incurable disease, when the Portuguese invaded his territories, did not expect to live out the day when his last decisive battle took place. Before the battle begun, he was carried along the ranks in an open litter, to encourage his troops; but finding afterwards the battle to go against him, though very near his last agonies, he threw himself out of his litter, rallied his army, and led them on to the charge, which ended in a complete victory to his party. He had no sooner brought his men to the engagement, than finding himself utterly spent, he was again replaced in his litter, where, laying his finger on his mouth, to enjoin secrecy to his officers, who stood around him, he died a few moments after in that posture. See Spectator, No. 349.

Anger is another actively stimulant passion. It rouses the powers of the body and mind, and impels them into action, accelerates the pulse, and produces redness and heat of the skin. These exertions are often so violent as to exhaust the vigour of the nervous system, as appears from the tremor of the limbs, and the faltering voice with which they are accompanied. When this passion has been still more vehement, various diseases have sometimes been the result, such as echymoses, hemorrhages, apoplexies, great distention of the heart, ruptured cicatrices of wounds, local inflammations, profuse perspiration, vomiting, and diarrhoea. Indeed the increase of the biliary secretion by this passion is very remarkable, and has been well attested both by ancient and modern observation; inasmuch that *bile* and *cholera* are deemed synonymous with *anger*. On the other hand, these stimulant effects have, under certain circumstances, proved remedial. Thus gout, palsy, dumbness, have all been removed by paroxysms of rage, and life itself evidently prolonged for several days. See Haller, loc. cit. and Falconer's Diff. on the Influence of the Passions on the Disorders of the Body, p. 13.

The genial and salutary influence of *hope*, in supporting the health against the impending evils of disease, by maintaining a steady excitement both of body and mind, has been strikingly illustrated on various occasions; and in no instance more remarkably, than in that of the siege of Breda, as described by Vander Mye, which we have detailed under the article IMAGINATION, before referred to. The distributions of an insignificant medicine among the garrison, said to be sent from their prince, and to possess infallible powers of curing the scurvy, effectually prevented the progress of that fatal malady. After mentioning this fact, the celebrated Dr. Lind, (in his Treatise on Scurvy,) observes, "an

important lesson is hence to be learned, the wonderful and powerful influence of the passions of the mind on the states and disorders of the body. This is too often overlooked in the cure of disorders, many of which are sometimes attempted to be cured by the sole mechanical operation of drugs, without calling in to our assistance the strong powers of the imagination, or the concurring influences of the soul. Hence it is, that the same remedy will not always produce the same effect, even in the same person, and that common remedies often prove wonderfully successful in the hands of bold quacks, but do not answer the purpose in a timorous and distrustful patient."

The *depressing* or debilitating passions produce an opposite effect; they rob the body of its vigour, diminish and interrupt the secretions, weaken the digestive powers, and, if continued, wear out the energies of life; while some of them, like a sudden and violent narcotic poison, instantaneously deprive the brain and nervous system of its powers, and occasion immediate death. *Fear* and *grief* are the most injurious, perhaps, of the depressing passions. Under the influence of *fear*, the force of the heart is diminished, and the pulse is rendered weak, variable, and intermittent; whence paleness, shivering, tremor, faintness, and even actual syncope, are attendant symptoms on the operation of this passion; whence also hæmorrhages of every kind have ceased under its influence, the natural secretions, as of the milk and perspiration, have been suppressed, and discharges from sores have stopped, and even the blood has not flowed from an opened vein. Or, on the other hand, from the general relaxation of the vessels, a cold and clammy sweat has been poured out by the exhalants, like that which attends syncope and great weakness; or a colliquative diarrhoea has occurred from the relaxed exhalants of the intestines. The effects of fear, very much resemble those of fatigue, watching, and other sources of debility, in rendering persons much more liable to receive the infection of pestilential diseases; whence the panic, which often accompanies an epidemic, tends greatly to increase the number of its victims. (See many references upon this point in Haller, loc. cit. p. 584.) It greatly debilitates the organs of digestion; whence flatulence, eructations, acidity, cramp at the stomach, and various other symptoms of want of power in the stomach and bowels are produced by it. When its impressions have been more violent, many severe examples of its directly sedative and paralyzing effects on the nervous system have occurred. Some persons have instantaneously lost the power of muscular exertion, remaining equally unable to fly or to defend themselves from the universal tremor which seized them. Van Swieten has recorded an instance, in which the tremor, so produced, continued during the remainder of life, namely, for twenty years. In other cases, palsy, amaurosis, loss of voice, mental imbecility, permanent melancholy, epilepsy, and even sudden death, have resulted from the violent impressions of fear.

Yet it is justly remarked by Haller, that *terror* and *alarm* have often a stimulant effect, like that of *anger*, and have produced violent exertions both of mental and corporeal power, and strong muscular action, even in the heart. Whence those who had lost the use of speech, have recovered it suddenly, and paralytic limbs have been roused to action, by a sudden alarm. Van Swieten relates from Hildanus, that a man, disguised to represent a ghost or spectre, took another, labouring under a paroxysm of gout, out of his bed, and carried him upon his back down the stairs, dragging his feet and legs, which were the seat of his pain, down the steps, and placed him at last on the ground. The man thus treated immediately recovered the use of his limbs, and ran

up the stairs again with great swiftness, and under the strongest impressions of terror. After this incident, he lived many years free from any symptoms of the gout. In a similar way, the gout has been suddenly cured by a fit of anger.

A sudden impression of *fear*, when accompanied by *despair* and *distress*, has sometimes occasioned a singular disorder of the cutaneous exhalants; we once witnessed an universal anasarca, or superficial dropsy, which was produced in the course of one night, in a poor woman, who had lost her pocket, containing a few pounds, which were her all, and the savings of many years. And *fear* combined with *anxiety* have, in many cases, which have fallen under our observation, produced extensive diseases of the skin, of an inflammatory and scaly nature. See Bateman's Pract. Synops. of Cutan. Dis. p. 149, note. Also Edin. Med. and Surg. Journ. vol. v. p. 127.

Grief is another depressing passion, the effects of which resemble in several respects those of fear, but differ in consequence of the longer duration of this passion. Grief diminishes the bodily strength in general, and particularly the force of the heart and circulation, as is obvious from the frequent sighs and deep respirations which attend it, and which seem to be necessary exertions, in order to promote the passage of the blood through the lungs. It diminishes perspiration, obstructs the menstrual discharge, produces paleness of the skin, and anasarca, and scirrhus obstructions in the glandular parts. It aggravates the scurvy, and the malignity of febrile and contagious distempers, and also renders people more apt to receive the infection of them. When it comes on suddenly and in a great degree, it excites palpitation of the heart, and renders the pulse irregular, and unequal in the two arms. Blindness, gangrene, and sudden death, have followed excessive grief; and its effects in changing the colour of the hair are well known.

One of the most remarkable effects of the passions on the body is exemplified in the *nostalgia*, or that vehement desire of re-visiting one's native country, which occurs in persons abroad. This is much allied to *grief*, and *hope* is its cure; for the moment that assurance of the opportunity of returning is given, the disease, which would otherwise terminate in atrophy and death, begins to disappear. See NOSTALGIA.

From this sketch of the effects of the passions on the operations of the animal economy, it must be obvious that they are important agents in the modifications of health, and the regulation of them becomes a matter of interesting inquiry to the physician, and affords him a source of considerable influence over the corporeal functions. Many difficulties, however, must occur in the management of these nice and precarious instruments, and the direction of them will be most successfully undertaken by those who possess the greatest discernment in estimating individual character and constitution, and who are possessed of what is called a knowledge of mankind and the world. A considerable influence towards the cure and alleviation of diseases, may, however, be easily exerted by the inspiration of hope and confidence, and by dispelling groundless fears and apprehensions: and even fictitious means, or such as a great philosopher might despise, are not to be neglected, where a depressing passion is thwarting the operation of medicine, and the natural efforts of the constitution. The powers of the traectors, and of animal magnetism, although purely imaginary, were nevertheless capable of producing substantial effects; and where the efficacy of our instruments can be thus augmented, by employing such mental aid, it is neither unphilosophical nor useless to resort to it. See IMAGINATION, *Influence of*.

We shall here subjoin some of those instances to which we

VOL. XXVI.

have referred in the preceding article, and with which ancient history presents us, of fatal effects from the excess of joy; but it plainly appears from their narration, that the subjects were, at the instant preceding, under the pressure of extreme anguish of mind. Pliny informs us (lib. vii. § 7.) that Chilo, the Lacedæmonian, died upon hearing that his son had gained a prize in the Olympic games. Valerius Maximus tells us (lib. ix. cap. 12.) that Sophocles, the tragic writer, in a contest of honour, died in consequence of a decision being pronounced in his favour. - Aulus Gellius (Noet. Attic. lib. iii. cap. 15.) mentions a remarkable instance of the effects of what may be termed accumulated joy, in Diagoras, who expired at the instant, when his three sons were crowned in the same day as victors; the one as a pugilist, the other as a wrestler, and the third in both capacities. Livy also (lib. xxii. cap. 7.) mentions the instance of an aged matron, who, while she was in the depth of distress, from the tidings of her son's having been slain in battle, died in his arms from the excess of joy upon his safe return. We are also told by the Italian historian Guicciardini, that Leo X. died of a fever, occasioned by the agitation of his spirits, on his receiving the joyful news of the capture of Milan, concerning which he had entertained much anxiety. In all these instances the previous state of mind, with its pathological effects upon the body, made the impulse of joy the stronger, and contributed to render it fatal.

PASSION, *Cæliac*. See CÆLIACA.

PASSION, *Hypochondriac*. See HYPOCHONDRIASIS.

PASSION, *Hysteriæ*. See HYSTERIA.

PASSION, *Iliac*. See ENTERITIS.

PASSIONS, in *Poetry*, denote the passionate sentiments, gestures, actions, &c. which the poet gives his persons.

The passions are, as it were, the life and spirit of the longer poems. Their necessity in tragedy and comedy is obvious; nor can the epopœia subsist without them.

It is not enough that the epic narration be surprising; it must likewise be moving and passionate, hurrying away the reader's mind, and filling it with anxiety, joy, terror, or some other violent passion, and this for subjects which it knows are feigned. Though passions be always necessary, yet all are not equally necessary, or suitable to all. Comedy has joy, and agreeable surprises, for its part; tragedy, on the contrary, has terror and compassion. The proper passion of the epopœia is admiration; though the epopœia, as a medium between the two others, takes in both their kinds of passions; as we see in the griefs of the fourth book of the *Æneid*, and the games and diversions of the fifth. Admiration, in effect, is consistent with each; we admire with joy the things that surprise us agreeably, and with terror and grief those that amaze and afflict us.

Besides the general passion, which distinguishes the epic from dramatic poems, each epopœia has its peculiar passion, which distinguishes it from other epic poems. This peculiar passion still follows the character of the hero. Thus wrath and terror reign in the *Iliad*, because Achilles is watchful, and *πανταρ εκ πανηλοτατ ανδρα*, the most terrible of men. And, on the contrary, the *Æneid* is all in the tender, softer passions; such being the character of *Æneas*. The prudence of Ulysses not allowing these excesses, we find none of them in the *Odyssey*.

As to the conducting of the passions, to make them have their effect, there are two things required; viz. that the audience be prepared or disposed to receive them; and that several incompatible passions be not mixed together.

The necessity of disposing the audience is founded on the natural necessity of taking up things where they are, in order to remove them elsewhere. The application of this maxim

is easy; a man is calm and at ease, and you would put him in a passion by a discourse made on purpose. You must begin, then, in a calm manner; by this means you join yourself to him; and afterwards, walking together, he will not fail to follow you in all the passions, to which you lead him insensibly.

If you shew your anger at first, you will be as ridiculous, and will have as little effect, as Ajax in the *Metamorphoses*; in whom the ingenious Ovid gives a fine example of this failing. He begins his harangue in the height of passion, and with the most violent figures, before his judges, who are in the deepest tranquillity.

“ ————— Sigeia torvo,
Litora prospexit, classemque in litore, vultu;
Protendensque manus, Agimus, pro Jupiter! inquit,
Ante rates causam, & mecum confertur Ulysses.”

The necessary dispositions arise from some preceding discourse, or, at least, from some action, which has already begun to raise the passions before they are mentioned. The orators themselves sometimes use this last means; for though ordinarily they do not raise the passions till the end of their discourse, yet when they find their audience already moved, it would be ridiculous in them, by an unseasonable tranquillity, to lay them again.

Thus, the last time Catiline came to the senate, the fathers were so shocked at his presence, that those near the place where he sat down, rose up, retired, and left him alone. On this occasion, Cicero had too much sense to begin his oration with the usual tranquillity and coolness of exordiums: by this means, he would have palled and abated the indignation of the senators against Catiline, which it was his business to spirit up and inflame; and he would have eased the parricide of that consternation the behaviour of the senators had given him, and which it was Cicero's business and design to aggravate. Omitting, therefore, the first part of this oration, he takes his auditors in the condition he finds them, continues and augments their passions: “*Quousque tandem abutere, Catilina, patientia nostra? Quamdiu nos etiam furor iste tuus eludet? Quem ad finem sese effrenata jactabit audacia? Nihilne te nocturnum praesidium palatii, nihil urbis vigiliae, nihil timor populi, nihil, &c.*”

The poets are full of instances of this kind, where the passion is prepared or kept up by actions. Dido, in Virgil, begins a discourse like Ajax: *Proh Jupiter, ibi hic, ait, &c.* But then the motions are here well disposed; Dido is before represented under terrible apprehensions of Æneas's quitting her, &c.

Seneca's conduct, indeed, is quite opposite to this rule. If he has a passion to raise, he is sure first to take from his audience any disposition they might have to be affected. If they be in grief, fear, or the expectation of something horrible, &c. he will begin with some fine description of the place, &c. In the *Troades*, Hecuba and Andromache being prepared to hear the violent and barbarous death of their son Astyanax, whom the Greeks precipitated from the top of a tower; of what avail was it to tell them, that, of the spectators that crowded from all quarters to see the execution, some placed themselves on stones, which the ruins of the walls made to project; that others shook their legs, as being placed too high, &c.

“*Alta rupes, cujus e cacumine
Erecta lummos turba libravit pedes.*”

The second thing required in the management of the passions is, that they be found pure, and disengaged from any thing that might prevent their effect.

Polymythy, therefore, *i. e.* a multiplicity of fables, actions, or histories, must be avoided; all adventures much broken, and hard to be retained, and all intrigues intricate, and difficult to conceive, are at once to be excluded. These embarrass the mind, and require so much attention, that there is none to spare for the passions. The soul must be free and disengaged to feel; on the contrary, we divert ourselves even from our real sorrows, by an application to other things.

But, of all others, the greatest enemies to the passions are the passions themselves: they oppose and destroy each other; and if two opposite ones, *e. gr.* joy and sorrow, meet in the same object, they will neither of them stand it. It is the nature of these habits that imposes this law: the blood and spirits cannot move gently and equally, as in a state of tranquillity, and, at the same time, be stopped and suspended with a violence occasioned by admiration. Nor can they be in either of those situations, while fear calls them from the outer parts of the body, to assemble them about the heart, or rage sends them into the muscles, and makes them act there with violences very opposite to the operations of fear.

The causes and effects, therefore, of the passions in the soul are to be studied, in order to be able to manage them with all their force. Virgil furnishes two examples of what we have said about the simplicity and engagement of each passion, in the deaths of Camilla and Pallas. See the *Æneid*.

PASSIONS, in *Rhetoric*, are objects that demand particular attention, both in the composition and delivery of public discourses. Accordingly one branch of rhetorical invention relates to the passions, and a suitable address to them forms a distinguishing part of the conclusion, or *peroration*, which see. As the passions are moving springs of action in the human frame, the orator who disregards them is not likely to accomplish the end at which he aims. As it is often highly necessary, it will likewise require his greatest skill, to engage them in his interest. Accordingly Quintilian calls this “the soul and spirit of his art,” and without doubt, nothing more discovers its empire over the minds of men, than this power which it possesses of exciting, appeasing, and swaying their passions, agreeably to the design of the speaker. The orator who engages the passions of his hearers will be thus aided on many occasions in convincing their judgment, and more especially in persuading them to pursue the course of conduct which he recommends. The passions are constituent parts of our frame as well as the understanding; and unless they are called forth into exercise, and when roused, properly directed and governed, we shall need some of the most powerful incentives to our inquiry after truth and to the regulation of our conduct agreeably to the conviction of our minds. Although the passions are liable to be perverted and abused, this is no reason why they should not be employed to important and useful purposes; more especially as this is the most likely method of guarding against the danger and injury, to which the want of due direction and controul would expose us. Quintilian makes it a necessary qualification of an orator, that he should be an honest man, and one who will not abuse his art. He will therefore engage the passions in the interest of truth and virtue; and he will thus render them instrumental in promoting the most useful purposes. The Stoics, who pretended to eradicate the passions, attempted what was in itself impossible, and in its consequences prejudicial to mankind. For while they appeared zealous assertors of the government of reason, they scarcely left it any thing to govern: for the authority of reason is principally exercised in ruling and moderating

derating the passions, which, when duly regulated, are the springs and motives to virtue. The passions, therefore, are not to be extirpated, as the Stoics asserted, but put under the direction and conduct of reason. The charge that has been brought against the art of oratory, for giving rules to influence the passions, is groundless and unjust; since the proper use of the passions is not to hinder the exercise of reason, but to engage men to act agreeably to reason. And if an ill use be sometimes made of this, it is the fault not of the art, but of the artist. But that an orator may be enabled to manage this part of his province to the best advantage, it is necessary that he should, in some measure, be acquainted with the nature, causes and objects of the passions. The passions to which the orator more particularly addresses himself differ according to the nature of the discourse. In demonstrative orations, when laudatory, love, admiration, and emulation are usually excited; but in invectives, hatred, envy, and contempt. In deliberative subjects, either the hope of gratifying some desire is set in view; or the fear of some impending evil. And in judicial discourses, almost all the passions have place, but more especially resentment and pity; insomuch that most of the ancient rhetoricians mention only these two. The objects of the passions are either *things* or *persons*, and orators make use of both for putting in motion these springs of the human mind. With regard to *things*, the nature and circumstances of them are to be considered; and different passions applied to, in order to induce people either to pursue or avoid them. *Persons* may be considered either as agents or patients. In the former sense, different regards are due to them, according to the different qualities with which they are possessed, and a suitable course of actions. So because virtue excites esteem, and vice hatred; answerable regards are paid to virtuous, or vicious men. But in considering them as patients, whatever befalls them according to their demerits, be the thing good or ill, others are generally pleased; and if the contrary happens, it gives them an uneasiness. So that if some good thing accrues to one, who does not deserve it, it causes indignation; and where a misfortune happens to a good man, it occasions pity. And thus persons are apt to be affected with respect to the circumstances of others. But every one is naturally inclined to think well of himself, that every prosperous occurrence is but answerable to his merit, and that every misfortune comes undeservedly. And sometimes there is joined with the occurrence the consideration of the agent, or person, who occasioned it; and the design in doing it is often more regarded, than the thing itself. The orator therefore will observe what circumstances either of things, or persons, or both, will furnish him with motives, proper to apply to those passions he desires to excite in the minds of his hearers. Thus Cicero, in his *orations for Plancus and Sylla*, moves his hearers from the circumstances of the men; but in his *accusation of Verres*, very frequently from the barbarity and horrid nature of his crime; and from both in his *defence of Quintus*.

But the same passion may be excited by very different methods. This is plain from the writings of those Roman satirists, which are yet extant; for they have all the same design, and that is to engage men to a love of virtue, and hatred of vice; but their manner is very different, suited to the genius of each writer. Horace endeavours to recommend virtue, by laughing vice out of countenance. Persius moves us to an abhorrence and detestation of vice, with the gravity and severity of a philosopher. And Juvenal by open and vehement invectives. So orators make use of all these methods in exciting the passions, as may be seen by their discourses, and particularly those of Cicero. But it

is not convenient to dwell long upon the same passion. For the image thus wrought up in the minds of the hearers, does not last a great while, but they soon return to reflection. When the emotion therefore is once carried as high as it well can be, they should be left under its influence, and the speaker proceed to some new matter, before it declines again. Moreover, orators sometimes endeavour to raise contrary passions to each other, as they are concerned for opposite parties. So the accuser excites anger and resentment, but the defendant pity and compassion. At other times, one thinks it sufficient to allay and take off that passion which the other has raised, and bring the hearers to a calm and sedate consideration of the matter before them.

But this especially is to be regarded, that the orator expresses the same passion himself, with which he endeavours to affect others, and that not only in his action, and voice, but likewise in his language; and therefore his words, and manner of expression, should be suited to that perturbation and disorder of mind, which he designs to represent. However, a decency and propriety of character are always carefully to be observed. For as Cicero very well remarks: "A neglect of this is not only very culpable in life, but likewise in discourse. Nor do the same things equally become every speaker, or every audience; nor every time, and every place." And therefore he greatly commends that painter, who designing to represent in a picture the sacrifice of Iphigenia, Agamemnon's daughter, drew Calchas the priest with a sad countenance; Ulysses, her father's great friend, more dejected; and her uncle Menelaus, most disconsolate; but threw a veil over the face of Agamemnon himself, as being unable to express that excess of sorrow, which he thought was proper to appear in his countenance. And this justness of character is admirably well observed by Cicero himself, in his *defence of Milo*. For as Milo was always known to be a man of the greatest resolution, and most undaunted courage, it was very improper to introduce him, as the usual method then was in capital cases, moving pity, and begging for mercy. Cicero therefore takes this part upon himself, and what he could not do with any propriety in the person of Milo, he performs in his own address to the judges. Cicero Orat. cap. 21, 22. 34. Ward's Orat. vol. i.

It is observed by Dr. Blair, that the higher eloquence (see ELOQUENCE) is the offspring of passion; or of that state of mind in which it is agitated and fired, by some object it has in view. A man may convince, and even persuade others to act, by mere reason and argument. But that degree of eloquence which gains the admiration of mankind, and properly denominates one an orator, is never found without warmth or passion. Passion, under due restraint, exalts all the human powers; it renders the mind infinitely more enlightened, more penetrating, more vigorous and masterly, than it is in its calm moments. A man, actuated by a strong passion, becomes much greater than he is at other times: he is conscious of more strength and force; he utters greater sentiments, conceives higher designs, and executes them with a boldness and a facility, of which, on other occasions, he could not think himself capable. But the power of passion is particularly felt with respect to persuasion. Almost every man, in passion, is eloquent. Then, he is at no loss for words and arguments. He transmits to others, by a sort of contagious sympathy, the warm sentiments which he feels: his looks and gestures are all persuasive; and Nature here shows herself infinitely more powerful than art. This is the foundation of that just and noted rule; "Si vis me flere, dolendum est primum ipsi tibi." Admitting this principle, that all high eloquence

flows from passion, we are able to account for the univerfally acknowledged effect of enthufiafm, or warmth of any kind, in public fpeakers, in affecting their audience. Hence alfo we perceive why laboured declamation, and affected ornaments of ftyle, which fhew the mind to be cool and unmoved, are fo inconfiftent with perfuafive eloquence; and alfo why all ftudied prettineffes, in gefture or pronounciation, detract fo much from the weight of a fpeaker. Hence alfo a difcourfe that is read, moves us lefs than one that is fpoken, as having lefs the appearance of coming warm from the heart. Hence it is, that to call a man cold is the fame thing as to fay, that he is not eloquent. Hence a fceptical man, who is always in fufpence and feels nothing ftroingly, and a cunning mercenary man, who is fufpected rather to affume the appearance of paffion than to feel it, have fo little power over men in public fpeaking. Hence, in fine, the neceffity of being, and being believed to be, difinterefted, and in earneft, in order to perfuade.

In reference to the queftion, whether it be confiftent with firmnefs and candour in a public fpeaker to address the paffions of his audience, Dr. Blair obferves, that this is a queftion about words alone, and which common fenfe eafily determines. In enquiries after truth, in matters of fimple information and inftruction, the paffions have no concern, and all attempts to move them are abfurd. Whereas, conviction is the object we are to apply only to the underftanding. It is by argument and reafoning that one man attempts to fatisfy another of what is true, or right, or juft; but if perfuafion be the object, the cafe is changed. In all that relates to praftice, there is no man who ferioufly means to perfuade another but addresses himfelf more or lefs to his paffions; for this plain reafon, that paffions are the giant fprings of human action. The moft virtuous man, in treating of the moft virtuous fubject, feeks to touch the heart of him to whom he fpeaks; and makes no fcruple to raife his indignation at injuftice, or his pity to the diftreffed, though pity and indignation be paffions. Blair's Lectures, vol. ii. See PATHETIC.

PASSION, in *Heraldry*. *Crofs of Passion* is a crofs thus called, becaufe in ftape of that on which our Saviour fuffered; *i. e.* not croffed in the middle, but nearer the top; with arms fhort, in proportion to the length of the ftap.

PASSION of our Lord *Jesus Chrift*, *Order of*, an order of knighthood faid to have been instituted on the conclufion of the peace between Richard II. king of England, and the French king Charles VI., with a view of protefting and affifting fuch Chriftians as were oppreffed in the Holy Land. The badge of the order was "a red crofs four fingers' broad, edged with gold, and charged on the centre with a cartouche, or octagon fhield, thereon a holy lamb," which crofs was worn by the knights, fewed on their habit, which was white.

PASSION, *Noble, Order of the*, was instituted in the year 1704, by John George, duke of Saxony Weifenfels, with a view to infpire the nobility of his dominions with great and elevated fentiments. The enftgn of the order is "a broad white ribband edged with gold," worn fcarfwife from right to left; pendent to which is a medal of gold; and on it "a ftar of eight points, charged with a crofs gules, furred with an oval blue, thereon the letters J. G. in a cypher in gold;" the ground of the medal without the ftar enamelled white, with thefe words "J'AIME L'HONNEUR QUE VIENET PAR LA VERTU:" on the reverfe are the arms of the principality of Querfurt, with this infcription, "SOCIÉTÉ DE LA NOBLE PASSION, INSTITUÉE PAR J. G. D. D. S. Q. 1704."

PASSION-Flower, in *Botany*. See PASSIFLORA.

PASSION *Week*, the week next preceding Eafter.

It is thus called from our Saviour's paffion, *i. e.* his crucifixion, &c. which happened on the Friday of this week, now called *Good Friday*.

PASSIONATO, in the *Italian Mufic*, intimates that the part to which it is annexed ought to be played paffionately, or in a moving and affecting manner.

PASSIONEI, DOMINICO, cardinal, in *Biography*, was born of a noble family, at Foffombrone, in the duchy of Urbino, in the year 1682. He was educated at the Clementine college in Rome, and at this early period of life he began to collect the copious library which he afterwards rendered fo ufeul to men of learning. In 1706 he vifited Paris, and contracted an acquaintance with Mabillon and Montfaucon, and other eminent fcholars of this metropolis. In 1708 he went to Holland, in the character of a negotiator. The belligerent powers in the Spanifh fucceffion-war, had fent deputies thither to treat for peace; and pope Clement XI., who could not have a nuncio in that country, fecretly commiffioned Paffionei to take care of the interefts of the Holy See. His efforts were fucceffful in procuring the evacuation of the papal territories by the German troops. In the year 1713, he was amply recompenf for his labours, by the pofts of privy chamberlain, and domeftic prelate to that pope, and afterwards by other high official fituations. He was employed in legations as well by Clement XI. as by his fucceffors. Benedict XIV. entrusted him with the moft important affairs, and in 1755 nominated him to the office of librarian of the Vatican. He exerted himfelf in augmenting the riches of this celebrated collection, and extended its ufeulnefs to literature by his correffpondences. The Academy of Infcriptions and Belles Lettres chofe him the fame year one of the foreign affiliates. He died of an apoplexy in 1761. He was juftly regarded as a great benefactor to learning, by the generous affiftance that he afforded to its votaries, and the liberal communication of his literary treafures. As an author, he joined Fontanini in a revision of the "Liber diurnus Romanorum Pontificum," and he wrote fome fcriptural paraphrafes, commentaries, and tranflations, and a funeral oration on prince Eugene. He alfo compiled the "Acta Legationis Helvetice," which has been found a ufeul guide to fucceeding nuncios. He had a nephew Benedict Paffionei, who published at Lucca, in 1765, a volume containing all the Latin and Greek infcriptions collected by this cardinal.

PASSIR, in *Geography*, a fea-port town, on the E. coaft of the ifland of Borneo, on a river which runs into the ftraits of Macaffar, about 45 miles from its mouth, with two fathoms water. The town contains about 300 wooden houfes, on the N. fide of the river, moft of them inhabited by Bugguets merchants, who carry on a confiderable trade in opium, Hindooftan piece-goods, fpices, gold, wax, &c. The houfe or wooden fort of the fultan, a Malay prince, is fituated on the S. fide, a very little way from the river. S. lat. 1° 57'. E. long. 116 10'.

PASSIVE, a term of relation, implying a thing to fuffer, or undergo the action of fome other; which, in refpect hereof, is denominatd *active*.

In all generations, philofophers conceive an active power, and a paffive.

In civil life, we fay, fuch a perfon, in fuch an election, has both an active voice, and a paffive, *i. e.* he is both capable of electing, and of being elected.

Some alfo ufe the term *paſſive debt*, for a debt which we owe another, in contradiftinction to an active debt, which is owing to us.

The ancient chemifts divide their principles, or elements, into

into active and passive. Passive are such as have no active force inherent in themselves, and which only act by being joined with some of the others.

PASSIVE Obedience, a doctrine held by the nonjurors, or high-churchmen, who maintained, that it was never lawful for the people, under any provocation or pretext whatever, to resist their sovereign. This doctrine has been warmly opposed by many, who think it both lawful and necessary, in certain circumstances, and in cases of an urgent and momentous nature, to resist the prince for the happiness of the people. In the present advanced state of civil and religious liberty, this doctrine is now almost exploded in our country.

PASSIVE Qualities. See **QUALITY**.

PASSIVE Understanding. See **UNDERSTANDING**.

PASSIVE Prayer, in the *Language of Mystic Divines*, is a total suspension or ligature of the intellectual faculties, in virtue whereof, the soul remains, of itself, and as to its own power, impotent with regard to the producing of any effects. See **PRAYER**.

The passive state, says Fenelon, is only passive in the same sense as contemplation is so, *i. e.* it does not exclude peaceable, disinterested acts, but only unquiet ones, or such as tend to our own interest.

In the passive state, the soul has not properly any activity, any sensation of its own: it is a mere infinite flexibility of the soul, to which the feeblest impulse of grace gives motion.

PASSIVE, in *Grammar*, denotes a second voice or inflexion of verbs, which, of active, become passive, by assuming, in the modern languages, new auxiliary verbs; and, in the ancient, by new terminations. See **VERB**, **VOICE**. &c.

The English verbs become passive, by taking the auxiliary verb *I am*, in lieu of *I have*, with which the active are conjugated; the French, by *Je suis*, in lieu of *J'ay*; the Italian, by *Io so*, for *Io ho*, &c.

Latin verbs become passive, by changing their terminations; as *amor*, for *amo*, &c. *amari*, for *amare*, &c.

English verbs passive are nothing else, in effect, but the verb *I am* in all its inflexions, joined to the particle passive; as *I am praised*, in Latin, *laudor*; in French, *Je suis loué*; *I have been praised*, *J'ay été loué*, *laudatus sum*, &c.

Mr. Harris, who considers all verbs, that are strictly so called, as energies, distinguishes active and passive verbs in the following manner. Every energy, he says, is naturally situate between two substantives, an energizer, which is active, and a subject, which is passive. Hence then, if the energizer lead the sentence, the energy follows its character, and becomes what we call a verb active. (See **ACTIVE**.) Thus we say, *Brutus amat*, *Brutus loves*. On the contrary, if the passive subject be principal, it follows the character of this too; and becomes what we call a verb passive. Thus we say, *Portia amatur*, *Portia is loved*.

PASSIVE, Neuter, is a verb that has a passive conjugation, but a neuter signification.

Of these there are a very small number in Latin, more in French, and fewer in English; as, *I am entered*, *ingressus sum*, *Je suis entré*, &c.

Grammarians are frequently mistaken here, taking verbs for neuters passives, which, in effect, are actives, and only differ in that they act on themselves, by adding the pronoun personal; and which, on that footing, should rather be neuters active than neuters passive.

Some admit of no genuine passive verbs in the modern tongues; such we mean as answer to the notion of passives in the ancient, where all is done by different terminations.

On which footing, there should be none but actives passive, and neuters passive.

PASSIVE Vassalage. See **VASSALAGE**.

PASSO, in *Music*. See **PASSAGE**.

PASSO, in *Geography*, a town of Portugal, in the province of Beira; seven miles E.S.E. of Lamego.

PASSODE' MOIA, a town of Naples, in Capitanata; 17 miles W.S.W. of Viclla.

PASSOVER, פסחא, a solemn feast, celebrated among the Jews, on the fourteenth day of the moon next after the vernal equinox, or the 14th day of the first month, that is, of the ecclesiastical year, which commenced with the flight of the Israelites out of Egypt; and which had the two names of Abib and Nisan. On the 14th day at even, the paschal lamb was to be killed and eaten, and from thence the feast was to be kept seven days, till the 21st. Exod. xii. 6. 8. 15. Lev. xxiii. 5, 6.

This feast was called, by the ancient Latins and Greeks, pascha, not from πασχα, *I suffer*, as Chrysostom, Irenæus, and Tertullian, weakly imagine, but from the Hebrew פסח, *pesach*, *passage*, *leap*; the design of the feast being to commemorate the destroying angel's *passing over* the houses of the Israelites, when he entered in, and destroyed the first-born in those of the Egyptians. Exod. xii. 27.

Many erroneously imagine, that it was in memory of their passing the Red sea that the passover was instituted; though it is certain the feast was held, and had its name, before the Israelites took a step of their way out of Egypt, and consequently several days before their passing the Red sea.

Besides the passover celebrated on the fourteenth of the first month, there was a second passover held on the fourteenth of the second month after the equinox, instituted by God in favour of travellers, and sick persons, who could not attend at the first, nor be at Jerusalem on the day.

The Greeks, and even some of the Catholic doctors, and several considerable critics, from the thirteenth, eighteenth, and nineteenth chapters of St. John, take occasion to conclude, that Jesus anticipated the day marked for the passover in the law; but the authority of three evangelists seems to evince the contrary. See Whitby's Dissertation on this subject, in an appendix to the fourteenth chapter of St. Mark.

F. Lamy is of opinion, that he did not attend at the passover the last year of his life; which sentiment has drawn upon him abundance of opposers.

F. Hardouin maintains, that the Galileans celebrated the passover on one day, and the Jews on another.

Some divines have maintained, and not without a considerable degree of probability, that the passover had a typical reference to Christ. Accordingly the apostle (1 Cor. v. 7.) calls him "our passover." Godwin and Witfius have stated a variety of particulars, in which this type resembles its anti-type; but in accommodating allusions of this kind, the imagination is too apt to mislead the judgment.

PASSOURA, in *Botany*, a genus of Aublet's, of which the flower is totally unknown. He describes the fruit as follows. "*Peric.* Capsule oblong, triangular, of one cell, and three valves. *Seeds* orbicular, three affixed to a longitudinal partition in the middle of each valve." No account is given of the origin of the name. The tree, which is a native of the Timoutou woods in Guiana and bore fruit in May, is described by Aublet as having a trunk sixteen or eighteen feet high, branched to the summit. *Leaves* opposite, stalked, ovate, acute, smooth, entire. *Fruit* forming a terminal spike, yellowish. *Seeds* spherical, green.

Jussieu has suggested, that it is very closely allied to

Riana,

Riana, Aubl. Guian. t. 94, in which case it must be classed in *Pentandria Monogynia*.

PASS-PAROLE. See *PASS-Parole*.

PASS-PAR-TOUT, a master-key; or key that opens indifferently several locks belonging to the same lodge or apartment.

PASSPORT, a licence or letter from a prince or governor, granting liberty and safe-conduct to travel, enter, and go out of his territories, freely, and without molestation.

The passport is properly given to friends, and the safe-conduct to enemies.

For the provision by Magna Charta, in favour of merchandize, see *MERCHANT*.

The violation of safe-conducts, or passports, expressly granted by the king or his ambassadors to the subjects of a foreign power in time of mutual war, or committing acts of hostility against such as are in amity, league, or truce with us, who are here under a general implied safe-conduct, are breaches of the public faith, without which there can be no intercourse or commerce between one nation and another; and such offences may, according to the writers upon the law of nations, be a just ground of a national war. And it is enacted by the statute 31 Hen. VI. cap. 4. now in force, that if any of the king's subjects attempt, or offend, upon the sea, or in any port within the king's obedience, or against any stranger in amity, league, or truce, or under safe-conduct, and especially by attacking his person, or spoiling him, or robbing him of his goods; the lord chancellor, with any of the justices of either of the king's bench or common pleas, may cause full restitution and amends to be made to the party injured.

Pasquier takes passport to have been introduced for *pass-par-tout*. Balzac mentions a very honourable passport given by an emperor to a philosopher in these terms: "If there be any one on land, or sea, hardy enough to molest Poramon, let him consider whether he be strong enough to wage war with Cæsar."

PASSPORT is also used for a licence, granted by a prince, for the importing or exporting merchandizes, moveables, &c. without paying the duties.

Merchants sometimes procure such passports for certain kinds of commodities; and they are always given to ambassadors and ministers, for their baggage, equipage, &c.

PASSPORT is also a licence obtained for the importing or exporting of merchandizes deemed contraband, and declared such by tariffs, &c., as gold, silver, precious stones, ammunition of war, horses, corn, wool, &c. upon paying duties.

PASSPORT, or *Pafs*, in *Sea Language*, denotes a permission granted by any state to navigate in some particular sea, without hindrance or molestation from it. It contains the name of the vessel, and that of the master, together with her tonnage, and the number of her crew, certifying that she belongs to the subjects of a particular state, and requiring all persons at peace with that state to suffer her to proceed on her voyage without interruption.

PASSULATUM, a name given by the ancients to a medicine composed of the pulp of raisins passed through a sieve, sometimes alone, sometimes with other ingredients.

PASSUM, a name given by the ancients to a kind of wine made of grapes, which had been suffered to remain on the vines till much withered and dried up: it is hence used also by some of the moderns to express raisin wine.

PASSUMACAN BAY, in *Geography*, a bay on the

east coast of the island of Luçon; 15 miles S. of cape Engano.

PASSUMPSICK, a small river of America, in Vermont, which, pursuing a southern course, discharges itself into Connecticut river, below the Fifteen Mile Falls, in the town of Barnet.

PASS-VOLANT, or PASSE-VOLANT. See *FAGGOT*. - In France, the *passé-volants* are condemned to be marked on the cheek with a fleur-de-lis.

PASSYUNK, in *Geography*, a town of America, in Philadelphia county, Pennsylvania, containing 884 inhabitants.

PASTACA, a river of Quito, which rises near Riobamba, and runs into the Maragnon, 50 miles W. of St. Joachim de Omaguas.

PASTE, in *Cookery*, a soft composition of flour, wrought up with proper fluid, as water, milk, or the like, to serve for cakes or coffins, therein to bake meats, fruits, &c.

Paste is the basis or foundation of pies, tarts, patties, pasties, and other works of pastry.

PASTE is also used in *Confectionary*, &c. for a preparation of some fruit, made by beating the pulp thereof with some fluid, or other admixture, into a soft pappy consistence, spreading it into a dish, and drying it with sugar, till it becomes as pliable as an ordinary paste. See *CONFECTS*.

It is used occasionally for making the crusts and bottoms of pyes, &c.

Thus, with proper admixtures, they make almond pastes, apple pastes, apricot pastes, cherry, currant, lemon, plum, peach, and pear pastes.

PASTE is also used for a preparation of wheaten flour, boiled up, and incorporated with water; used by various artificers, as upholsterers, saddlers, bookbinders, &c. instead of glue or size, to fasten or cement their cloths, leathers, papers, &c.

When paste is used by bookbinders, or for paper-hangings to rooms, it is usual to mix a fourth, fifth, or sixth, of the weight of the flour of powdered resin; and where it is wanted still more tenacious, gum arabic, or any kind of size, may be added. Paste may be preserved, by dissolving a little sublimate, in the proportion of a dram to a quart, in the water employed for making it, which will prevent not only rats and mice, but any other kinds of vermin and insects, from preying upon it.

PASTES, in the *Glass Trade*, a sort of composition of the glass kind, made from calcined crystal, lead, and metallic preparations, to imitate the several natural gems. These are no way inferior to the native stones, when carefully made and well polished, in brightness and transparency, but want their hardness.

The general rules to be observed in making them are these: 1. That all the vessels in which they are made are firmly luted, and the lute left to dry before they are put into the fire. 2. That such vessels are chosen for the work as will bear the fire well. 3. That the powders be prepared on a porphyry stone, not in a metal mortar, which would communicate a tinge to them. 4. That the just proportion in the quantities of the several ingredients be nicely observed. 5. That the materials be all well mixed; and if not sufficiently baked the first time, to be committed to the fire again, without breaking the pot; for, if this be not observed, they will be full of blisters and air-bladders. 6. That a small vacuity be always left at the top of the pot, to give room to the swelling of the ingredients.

To make a paste of extreme hardness, and capable of all the

the colours of the gems, with great lustre and beauty, take of prepared crystal ten pounds; salt of pulverine, six pounds; sulphur of lead, two pounds: mix all these well together, into a fine powder; make the whole, with common water, into a hard paste; and make of this paste small cakes, of about three ounces weight each, with a hole in them, made in their middle: dry these in the sun, and afterwards calcine them in the straightest part of a potter's furnace; after this powder them, and levigate them into a perfect fineness on a porphyry, and set this powder in pots in a glass furnace to purify for three days; then cast the whole into water, and afterwards return it into the furnace, where let it stand fifteen days; in which time all foulness and blisters will disappear, and the paste will greatly resemble the natural jewels. To give this the colour of the emerald, add to it brass thrice calcined; for a sea-green, brass simply calcined to redness; for a sapphire, add zaffer, with manganese; and for a topaz, manganese and tartar. All the gems are thus imitated in paste, by the same way of working as the making of the coloured glasses; and this is so hard, that they very much approach to the natural gems.

The colours in all the counterfeit gems, made of the several pastes, may be made deeper or lighter, according to the works for which the stones are designed; and it is a necessary general rule, that small stones for rings, &c. require a deeper colour, and large ones a paler. Besides the colours made from manganese, verdigris, and zaffer, which are the ingredients commonly used, there are other very fine ones, which care and skill may prepare: very fine red may be made from gold, and one not much inferior to that from iron; a very fine green from brass or copper, and a sky-colour from silver; and a much finer one from the common small garnets of Bohemia, which are of little value. The gems also afford glorious colours like their own.

The fine blue from silver is, probably, only from the small quantity of copper used in the alloy.

A very singular and excellent way of making the paste to imitate the coloured gems is this: take a quantity of saccharum saturni, or sugar of lead, made with vinegar in the common way; set it in sand, in a glass body well luted from the neck downwards; leave the mouth of the glass open, and continue the fire twenty-four hours; then take out the salt, and if it be not red, but yellowish, powder it fine, and return it into the vessel, and keep it in the sand-heat twenty-four hours more, till it becomes as red as cinnabar. The fire must not be made so strong as to melt it, for then all the process is spoiled. Pour distilled vinegar on this calcined salt, and separate the solution from the dregs: let the decanted liquor stand six days in an earthen vessel, to give time for the finer sediment to subside: filter this liquor, and evaporate it in a glass body, and there will remain a most pure salt of lead; dry this well, then dissolve it in fair water; let the solution stand six days in a glazed pan; let it subside, then filter the clear solution, and evaporate it to a yet more pure white and sweet salt; repeat this operation three times; put the now perfectly pure salt into a glass vessel, set it in a sand-heat for several days, and it will be calcined to a fine impalpable powder, of a lively red. This is called the sulphur of lead. Neri's Art of Glass.

Take all the ingredients as in the common composition of the pastes of the several colours, only instead of red lead, use this powder, and the produce will well reward the trouble of the operation, as experience has often proved.

A paste proper for receiving colours may be readily made by well pounding and mixing six pounds of white sand, cleaned, three pounds of red lead, two pounds of purified pearl-ashes, and one pound of nitre. A softer paste may be

made, in the same manner, of six pounds of white sand cleaned; red lead, and purified pearl-ashes, of each three pounds; one pound of nitre, half a pound of borax, and three ounces of arsenic. For common use, a pound of common salt may be substituted for the borax. This glass will be very soft, and will not bear much wear, if employed for rings, buckles, or such imitations of stones, as are exposed to much rubbing; but for ear-rings, ornaments worn on the breast, and those little used, it may last a considerable time.

In order to give paste different colours, the process is as follows.

PASTE resembling amethyst.—Take ten pounds of either of the compositions described under *Colouring of GLASS*; one ounce and a half of manganese, and one dram of zaffer; powder and fuse them together. See *AMETHYST*.

PASTE perfectly black.—Take ten pounds of either of the compositions just referred to, one ounce of zaffer, six drams of manganese, and five drams of iron, highly calcined; and proceed as before.

PASTE, Blue.—Take of the same composition ten pounds; of zaffer, six drams; and of manganese, two drams; and proceed as with the foregoing.

PASTE resembling the chrysolite.—Take of either of the compositions for paste above described, prepared without salt-petre, ten pounds, and of calcined iron five drams; and pursue the same process as with the rest. See *CHRYSOLITE*.

PASTE resembling the red cornelian.—Take of the compositions mentioned under *Colouring of GLASS*, two pounds; of glass of antimony, one pound; of the calcined vitriol, called scarlet ochre, two ounces; and of manganese, one dram. Fuse the glass of antimony and manganese with the composition; then powder them, and mix them with the other, by grinding them together, and fuse them with a gentle heat.

PASTE resembling white cornelian.—Take of the composition just referred to, two pounds; and of yellow ochre, well washed, two drams; and of calcined bones, one ounce. Mix them and fuse them with a gentle heat.

PASTE resembling the diamond.—Take of the white sand, six pounds; of red lead, four pounds; of pearl-ashes, purified, three pounds; of nitre, two pounds; of arsenic, five ounces; and of manganese one scruple. Powder and fuse them.

PASTE resembling the eagle-marine.—Take ten pounds of the composition under *GLASS*; three ounces of copper, highly calcined with sulphur; and one scruple of zaffer. Proceed as before.

PASTE like emerald.—Take of the same composition with the last, nine pounds; three ounces of copper, precipitated from aquafortis, and two drams of precipitated iron. See *EMERALD*.

PASTE like garnet.—Take two pounds of the composition under *GLASS*; two pounds of the glass of antimony; and two drams of manganese. For vinegar garnet, take of the composition for paste, described in this article, two pounds; one pound of glass of antimony, and half an ounce of iron, highly calcined; mix the iron with the uncoloured paste, and fuse them; then add the glass of antimony, powdered, and continue them in the heat till the whole is incorporated. See *GRANITE*.

PASTE, gold, or full yellow colour.—Take of the composition for paste ten pounds, and one ounce and a half of iron strongly calcined; proceeding as with the others.

PASTE, deep purple.—Take of either of the compositions for paste ten pounds; of manganese, one ounce; and of zaffer, half an ounce.

PASTE, resembling ruby.—Take one pound of either of the compositions for *paste*, and two drams of *calx cassii*, or precipitation of gold by tin; powder the *paste*, and grind the *calx* of gold with it in a glass, flint, or agate mortar, and then fuse them together. A cheaper ruby *paste* may be made with half a pound of either of the above compositions, half a pound of glass of antimony, and one dram and a half of the *calx* of gold; proceeding as before.

PASTE resembling sapphire.—Take of the composition for *paste*, ten pounds; of *zaffer*, three drams and one scruple; and of the *calx cassii* one dram. Powder and fuse them. Or the same may be done, by mixing with the *paste* one-eighth of its weight of *smalt*. See **SAPPHIRE**.

PASTE like topaz.—Take of the composition under **GLASS** ten pounds, omitting the *sal-petre*; and an equal quantity of the gold-coloured hard glass. Powder and fuse them. See **TOPAZ**.

PASTE like turquoise.—Take of the composition for *blue paste*, already described, ten pounds; of calcined bone, horn, or ivory, half a pound. Powder and fuse them.

PASTE, opaque white.—Take of the composition for *paste*, ten pounds; and one pound of calcined horn, ivory, or bone; and proceed as before.

PASTE, semi-transparent white, like opal. See **OPAL**.

PASTE for angling.—There are many receipts which particular people are fond of; but the following composition seems one of the best: take equal quantities of fresh butter and sheep's suet, about half as much of good old cheese, and the crum of an old stale white loaf, as much as will, when they are all beaten in a mortar, make the whole into a *paste*; add a little wool or tow, that it may keep the better on the hook. The place should be baited with blood and grains over night, and in the morning this *paste* will be found an excellent bait. See **FISHING**.

PASTES for birds, a general sort of food made by the people who breed up birds from the nest, and suiting almost all kinds.

It is made in the following manner: grind half a peck of large beans, well dried, to a very fine meal; take of this meal two pounds; of the best sweet almonds blanched, one pound; these must be well beat together in a mortar, till perfectly mixed; then to a quarter of a pound of fresh butter, in a sauce-pan well tinned, add the *paste*, and mix all well together over a charcoal fire, stirring it as it boils with a wooden spoon; then add the yolks of four eggs, and a little saffron, and finally a small quantity of the finest virgin honey. When these are well incorporated, and are tolerably thin and without lumps, the whole is to be poured into a colander, made with such holes as will let the composition pass through: if any of it is so stiff that it will not go through, it must be beat again in a mortar, and by that means made fit to pass the holes, and mix with the rest. When the whole is done, it is to be put into a pot, and a little clarified honey being melted and poured on it, it will keep very well for six months or longer.

PASTEBOARD, a kind of thick paper, formed of several sheets pasted together.

There is also a coarse kind of *pasteboard*, made of old paper, and old *pasteboard*, beaten in a mortar with water, and reduced into a kind of pulp; to which is added a little *paste*, to give the mass a consistence, after which it is formed into a mould, and, to finish it, laid in a press, to squeeze out all the water, and reduce it to its proper thickness.

Each kind is distinguished by numeroes, which express the fineness and value: the finest is covered on both sides

with a very white smooth paper; others only on one side; and others on both sides with common paper.

The chief use of *pasteboard* is in the binding of books, and the making of letter-cases, hat-cases, gloves, &c. See **BOOK-BINDING**.

For the duty on *pasteboard*, see **PAPER**.

PASTEHI, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir; 56 miles W.N.W. of Diarbekir.

PASTEL. See **PASTIL**.

PASTERN of a horse, the distance between the fetlock or joint next the foot and the coronet of the hoof.

This part should be short, especially in the middle-sized horses; because long pasterns are weak, and cannot so well endure travel.

PASTERN Joint, is the joint above the pastern.

The pastern joint, after travelling, is very apt to be crowned, *i. e.* to have a swelling round it, beneath the skin, in form of a circle, a third of an inch broad.

PASTICCIO, literally means, in Italian, a pie or pastry; but in music implies an opera composed of detached airs by different composers, frequently introduced without any connection with the drama, character, or situation of the singer.

PASTIL, or **PASTEL**, among *Painters*, &c. a sort of *paste*, made of several colours, ground up with gum-water, either together or separately, in order to make crayons to paint with on paper or parchment. See **CRAYON**.

PASTIL, *Pastillus*, is also used for a dry composition, yielding a fragrant smell when burnt in a perfuming pan, to clear and scent the air of a chamber.

It is composed of odorous resins, mixed with aromatic woods or drugs pulverised, and incorporated with mucilages of gum tragacanth. Some call these compositions *offelets* of Cyprus.

There are also *pastils* for the mouth, chewed to procure a sweet breath. These have several names, and consist of several preparations, as muscadines, conserves, &c.

PASTIL, or *Pastil*, is sometimes used for the plant otherwise called *wood*.

PASTIL, in *Confectionary*, is a preparation of sugar with lemon-water, &c. boiled up with gum-water, strained, beat up, and, by the addition of more dry sugar, worked into a pliable *paste*, and thus formed into round or oblong figures, and dried in a stove. See **LOZENGE**.

PASTINACA, in *Botany*, said, by some authors, to be derived from *pasco*, to feed, or from *pastus*, a pasture, on account of the nourishing qualities of its roots which are eaten by the poor. Linnæus rather considered the name as derived from *pastinum*, a forked tool, used in digging or planting vineyards, which the root of *Pastinaca* resembles. Linn. Gen. 144. Schreb. 194. Willd. Sp. Pl. v. 1. 1465. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 328. Prodr. Fl. Græc. v. 1. 202. Ait. Hort. Kew. ed. 2. v. 2. 157. Tournef. t. 170. Juss. 219. Lamarck Illustr. t. 206. Gærtner. t. 21.—Class and order, *Pentandria Digynia*. Nat. Ord. *Umbellata*, Linn. *Umbellifera*, Juss.

Gen. Ch. *General umbel* of many rays, flat; *partial* of many rays. *General involucre* none; *partial* none. *Petianth* obsolete. *Cor.* *Universal*, uniform; flowers all fertile; *partial* of five, lanceolate, involute, undivided petals. *Stam.* Filaments five, capillary; anthers roundish. *Pist.* Germen inferior; styles two, reflexed; stigmas obtuse. *Peric.* Fruit much compressed, elliptical, divisible into two parts. *Seeds* two, elliptical, girt round the margin, nearly flat on both sides.

PASTINACA.

Ess. Ch. Fruit elliptical, compressed almost flat. Petals involute, entire. Involucrum neither general nor partial.

1. *P. lucida*. Shining-leaved Parsnep. Linn. Mant. 58. Jacq. Hort. Vind. v. 2. p. 94. t. 199. Gouan. Illustr. 19. t. 11. and 12. —Leaves simple, heart-shaped, lobed, thinning, acutely notched.—Native of the south of Europe, especially in the Balearic islands. It flowers in June and July.—*Root* biennial, thick, milky. *Stem* upright, rugged, grooved and angular, branched from the bottom, and, according to Gouan, five or six feet in height, yielding, when cut, a foetid, tenacious gum, smelling like rue. *Leaves* alternate, on stalks, large and handsome; dark green on the upper side; much paler, and veiny beneath. In luxuriant specimens they are sometimes ternate, or even quinate. *Flowers* yellow.—This elegant umbelliferous plant is smooth all over, having a strong, unpleasent taste and smell, which remains unimpaired even after the plant has been dried many years.

2. *P. fativa*. White Parsnep. Linn. Sp. Pl. 376. Engl. Bot. t. 556. Mart. Rust. t. 83.—Leaves simply pinnate, downy beneath.—Native of Great Britain, and of the south of Europe, on hills, and in the borders of fields, on a calcareous soil.—It flowers in July.—*Root* biennial, spindle-shaped, aromatic, sweet, but acrid. *Stem* three feet high, erect, branched, angulated, furrowed, roughish. *Leaves* pinnate; leaflets from five to nine, cut or serrated, the terminal one three-lobed. *Flowers* small, yellow, in terminal, solitary, erect, roughish umbels of many rays. *Fruit* large, elliptical, flat, ribbed, smooth, light brown when ripe.

The common garden parsnep is a cultivated variety of this species, with larger, smoother leaves, and a mild eatable root.—The highly saccharine juice of this plant is found to render it exceedingly nutritious food for various kinds of animals. The roots are sweeter than carrots, and Gerarde says, that “a good and pleasant food or bread may be made of them.” Nevertheless, they disagree with some stomachs.

3. *P. Opopanax*. Rough Parsnep. Linn. Sp. Pl. 376. Gouan. Illustr. 19. t. 13, 14. Woody. Med. Bot. v. 2. 309. t. 113.—Leaves pinnate; leaflets gashed at the base in front.—Native of the east of the south of Europe, flowering in June and July.—*Root* perennial, thick, fleshy, tapering. *Stalk* seven or eight feet high, strong, branched, rough towards the bottom. *Leaves* pinnate, composed of many pairs of oblong, serrated veined leaflets. *Flowers* small, yellow, in terminal, flat umbels.

This species has long held a distinguished place in the *Materia Medica*, as affording the gum-resin called *Opopanax*.

Woodville says the plant bears the cold of our climate very well, but it is only in the warm regions of the East, that the juice concretes into the appearance under which we have it, imported from Turkey and the East Indies, viz. “in little round drops or tears, more commonly in irregular lumps, of a reddish-yellow colour, on the outside with specks of white, internally of a paler colour, and frequently variegated with large white pieces.”

We have already mentioned that *Laserpitium Chironium* of Linnæus is probably the same plant with this. See *LASERPITIUM*.

PASTINACA, in *Gardening*, contains plants of the herbaceous eulent kind, of which the species cultivated are, the common parsnep (*P. fativa*); and the rough parsnep (*P. opopanax*).

The garden or cultivated variety of this species has smooth leaves, of a light or yellowish-green colour, in which it differs from the wild plant: the stalks also rise higher, and are deeper channelled: the peduncles are much longer, and the flowers of a deeper yellow colour: the roots are sweeter than those of the carrots, and are much eaten by those who

abstain from animal food in Lent, or eat salt-fish; and are highly nutritious. Hogs are fond of these roots, and cattle will eat them with avidity.

Method of Culture.—This in the first sort is easily effected by sowing fresh seed in the latter end of February, or beginning of the following month, upon a bed prepared in a spot of the best light, rich, deep soil, in one of the most open airy quarters of the garden, by being trenched one full spade deep at least, or if two the better, provided the depth of good staple admit, that the roots have a due depth of loose soil to run down straight to their full length. And if the ground be previously trenched up in rough ridges in winter, especially where stiff or wet, and lie exposed some time to the sun and air, it will be much improved for this purpose. At the time of sowing, the ground should be made level and even on the surface, but not raked till after the seed is sown, which should be performed while the ground is fresh stirred, or before the surface becomes too dry, so as, in raking, the clods will readily fall under the rake to bury the seed regularly.

And the seed should be sown broad-cast thinly, either all over the surface, or the ground may be divided into four-foot-wide beds, as most convenient, but for large quantities the former is the most eligible practice. As soon as the sowing is done, if light ground, it is the practice with some to tread down the seeds evenly, and finish with an even good raking, to cover them equally, smoothing the surface. In about three weeks the seeds begin to germinate, and the plants soon appear above ground. When they are two or three inches high, they should be thinned to regular distances, and cleaned from weeds; which may be done either by hand or small hoeing; but the latter is preferable for the benefit of the crop, and considerably the most expeditious: it should generally be performed by a three or four-inch hoe. Dry weather should be chosen for the purpose, and the plants cut out to about ten or twelve inches distance, as they should have large room, cutting up all weeds as the work proceeds. After this, no more culture is required till the future progress of the weeds renders another hoeing necessary; and probably another repetition may also be required, till the plants are in full leaf, when they cover the ground, and bid defiance to any further interruption from weeds.

In the autumn, about October, the roots will be arrived nearly at their full growth; when the leaves begin to turn yellow and decay, which is a certain sign of their maturity, they may then be dug up for use, as they are wanted.

They may also either remain in the ground all winter, and be taken up as wanted, or a quantity may be dug up in autumn, and their tops pared off close, and then buried all winter in sand, in a shed or other dry place, to be ready at all times for use: some should also be left in the ground for spring service, as January or the beginning of February, digging them up just before they begin to shoot, and laying them in the sand; as by taking them up at this time, it retards their effect for shooting, so as that they continue in tolerable perfection until the latter end of April or longer.

But in order to have parsneps in due perfection, great care is necessary to save seed only from some of the finest rooted plants; for which purpose, a quantity of the large, long, straight roots should be selected, trimming off their leaves, and planting them in rows three feet asunder, and two distant in the lines, about an inch deep over their top; in which method they will shoot up strong in spring for flowering, and ripen seed in the latter end of August, or early in September; when in a dry day, the umbels of seed should be cut off and spread upon mats to dry and harden,

afterwards thrashing out the seeds, and putting them up in bags for use.

And the second sort may be raised, by sowing the seed in the places where the plants are to remain, at the same season as the above; keeping the plants afterwards properly thinned and clear from weeds.

The first is an useful esculent root, that contains a large proportion of nutritious matter; but the latter is chiefly cultivated for affording variety in the borders or other parts of pleasure-grounds.

PASTINACA Marina, in *Ichthyology*, the name of a fish, called in English the *poison-fish*, *fire-flaire*, or *sting-ray*. It is one of the flat cartilaginous fishes, and something like the common skate. It is a species of the raia, or ray-fish, and distinguished by Artedi from the other species, by the name of the smooth-bodied ray, with no fins to the tail, but with a long, bony, serrated spine in it. See *RAJA Pastinaca*.

This fish is the *τρογύνη* of Aristotle and Oppian, and is called by the modern Italians, *banco*.

Its tail, in which all its poison is said to be lodged, is long, smooth, and round, with a thorn, or dart, of a finger's length, toothed on each side like a saw, with the teeth standing upwards, or toward the head. This is placed at the distance of about one-third of the length of the tail; and that from this place grows very slender, and ends in a very slender point. It grows, sometimes, to ten pounds weight; and when the tail is cut off, is commonly sold in the markets of Italy, and elsewhere.

Authors give us many remarkable accounts of the poison of this fish, which it communicates to animals by the stroke of its tail. They mention also two kinds of it; that is, beside the ordinary species, which is smooth, another called the *pastinaca marina aspera*, which is rough and prickly.

Mr. Pennant observes, that there is no credit due to the generally received opinion of its venomous qualities, though even Linnæus has adopted it. The spine is the weapon of offence belonging to the fish, which is capable of giving a very bad wound, attended with dangerous symptoms, when it happens on a tendinous part, or to a person with a bad habit of body. Pennant's *British Zool.* vol. iii. p. 95.

PASTINATION, a term sometimes used in *Agriculture*, for the act of opening, loosening, and preparing the earth for planting.

PASTO, in *Geography*, a town of Peru; 80 miles N. N. E. of Lima.

PASTO, *St Juan de*, a town of South America, in the province of Popayan, capital of a district, in the viceroyalty of New Granada, containing above 7000 inhabitants; 80 miles S. S. W. of Popayan. N. lat. 1° 15'. W. long. 76° 46'.

PASTOPHORI, *παστοφοροι*, among the ancients, priests whose business it was, at solemn festivals, to carry the shrine of the deity, when they were to pray to him for rain, fair weather, or the like.

PASTOPHORIA, in *Antiquity*, the apartments, near the temples, where the *pastophori* were lodged.

Clemens Alexandrinus, describing the temples of the Egyptians, says, that, after having passed through magnificent courts, you are conducted to a temple, which is at the farther end of these courts, and then a *pastophorus* gravely lifts up the veil, which is the door, to shew you the deity within; which is nothing but a dog or a cat, or some other animal. These *pastophori* also supported the shrine, or niche of these ridiculous divinities, when they were carried in procession. Apuleius speaks of the *pastophori* that carried the Syrian goddesses.

In the temple of Jerusalem there were two courts sur-

rounded with galleries, and all round about were several lodging rooms for the priests, to lay up wood, wine, oil, salt, meal, spices, incense, vestments, valuable vessels, and provisions necessary for the sacrifices and lamps, as also for the support and maintenance of the priests. See 1 Chron. ix. 26, 33. Ezek. xl. 17, 18. 1 Chron. xxvi. 16.

PASTOR, originally signifies one that (*pasceit*) feeds. Hence it was anciently used for a *shepherd*, or *advocate*; and is now appropriated to a *minister*, or one that has the cure of souls.

PASTOR Piscis, in *Ichthyology*, the name of a fish of the mullet kind, caught in the American seas and rivers, and esteemed a very well-tasted one.

It is the usual size of our river trout, and not unlike that fish in shape; its scales are large, and of a silvery white, and are ranged in the same order with those of the perch, with greyish lines between the several arrangements; it has seven fins, all very large, especially that on the back, and its tail is remarkably forked; all the fins are white, and the covering of the gills are scaly; not bony, as in most other fishes; whence it has been supposed to have no gills.

PASTORAL, something that relates to shepherds, *pastores*. The poets represent the innocence of a pastoral life, and pastoral manners, in the most agreeable light. We must not imagine them so beautiful in nature as in their descriptions.

PASTORAL, in *Poetry*, denotes a composition, the subject of which is something in the pastoral, or at least in rural life, and the persons shepherds, or at least rustics.

Most authors, says Dr. Blair, have indulged the fancy, that because the life which mankind led at first was rural, their first poetry was therefore pastoral, or employed in the celebration of rural scenes and objects; but he is of opinion that, though it would borrow many of its images and allusions from those natural objects, with which men were best acquainted, the calm and tranquil scenes of rural felicity were not the first objects which inspired that strain of composition, which we now call poetry. The first themes were furnished to the bards of every country by objects and events that roused men's passions; such as the actions of their gods and heroes, their own exploits in war, and the successes or misfortunes of their countrymen and friends. What was of a pastoral kind in their compositions was merely incidental. It was not till men had begun to be assembled in great cities, after the distinctions of rank and station were formed, and the bustle of courts and large societies was known, that pastoral poetry assumed its present form. It was in the court of king Ptolemy, that Theocritus wrote the first pastorals with which we are acquainted, and in the court of Augustus, he was imitated by Virgil. Pastoral poetry, whatever was its origin, is undoubtedly a natural and very agreeable form of composition. It recalls to our imagination those gay scenes, and pleasing views of nature, which are commonly the delight of our childhood and youth; and to which, in more advanced life, most men recur with pleasure. It exhibits to us a life, with which we are accustomed to associate the ideas of peace, of leisure, or of innocence; and therefore we readily set open our hearts to such representations as promise to banish from our thoughts the cares of the world, and to transport us into calm Elysian regions. No subject, at the same time, seems to be more favourable to poetry. Amidst rural objects, nature presents, on all hands, the finest field for description; and nothing appears to flow more, of its own accord, into poetical numbers, than rivers and mountains, meadows and hills, flocks and trees, and shepherds void of care. Hence

PASTORAL.

it is, that this species of poetry has, at all times, allured many readers and excited many writers. Nevertheless, there is hardly any species of poetry more difficult to be carried to perfection, or in which fewer writers have excelled. Pastoral life is described by the author now cited in three different states of it; either as it now is, when shepherds are reduced to a mean, servile, and laborious condition; or such as it may be supposed to have been, in the more early and simple ages, when flocks and herds were numerous, and shepherds, though unrefined in their manners, were respectable in their situation; or such as it never was, nor can be, when to the ease, innocence, and simplicity of the early ages, we attempt to add the polished taste and cultivated manners, of modern times. The first of these states is too gross and mean, and the last too refined and unnatural, to become the ground-work of pastoral poetry. Theocritus is censured for having deviated too much to the first extreme: and some of the French and Italian writers of pastorals have erred in making their shepherds discourse like courtiers and scholars: and in either way a person may retain the name, whilst he wants the spirit of pastoral poetry. He that would succeed in this species of composition must keep in the middle station between these two extremes. The great charm of pastoral poetry arises from the view which it exhibits of the tranquillity and happiness of a rural life. This pleasing illusion the poet must be careful to maintain. The true spirit of a pastoral poet is conspicuously displayed by Virgil in the following beautiful lines of the first eclogue, in which he has brought together as agreeable an assemblage of images of rural pleasure as can any where be found.

“Fortunate Senex! hic inter flumina nota, &c.”

“Happy old man! here mid th’ accustom’d streams
And sacred springs, you’ll shun the scorching beams;
While from yon willow fence, the pasture’s bound,
The bees that suck their flowery stores around,
Shall sweetly mingle, with the whispering boughs,
Their lulling murmurs, and invite repose.
While from steep rocks the pruner’s song is heard;
Nor the soft cooing dove, thy fav’rite bird,
Meanwhile shall cease to breath her melting strain,
Nor turtles from th’ ærial elms to plain.” Wharton.

Pastoral poetry offers to our consideration its scenery, its characters, and the subjects and actions which it should exhibit. As to the *scene*, it must be laid in the country, and the poet’s merit much depends on describing it beautifully. Virgil is, in this respect, deemed to have been excelled by Theocritus, whose descriptions of natural beauties are richer and more picturesque than those of the other. The following description exhibits rural scenery painted in very lively colours.

“——— ἐν τῷ Βαβυλίῳ, &c.” Idyll. vii. 132.

“——— on soft beds recline
Of lentisk, and young branches of the vine;
Poplars and elms above, their foliage spread,
Lent a cool shade, and wav’d the breezy head;
Below, a stream, from the nymph’s sacred cave,
In free meanders led its murmur’ing wave;
In the warm sun-beams, verdant shades among,
Shrill grasshoppers renew’d their plaintive song:
At distance far, conceal’d in shades, alone,
Sweet Philomela pour’d her tuneful moan:

The lark, the goldfinch, warbled lays of love,
And sweetly pensive, coo’d the turtle dove:
While honey bees, for ever on the wing,
Hum’d round the flowers, or sipt the silver spring.
The rich, ripe season gratified the sense
With summer’s sweets, and autumn’s redolence.
Apples and pears lay strew’d in heaps around,
And the plum’s loaded branches kiss’d the ground.”

Fawkes.

As to the *characters*, or persons, that are proper to be introduced into pastoral poetry, they must be shepherds, or persons wholly engaged in rural occupations; whose innocence and freedom from the cares of the world may, in our imagination, form an agreeable contrast with the manners and characters of those who are engaged in the bustle of life.

In the choice of the *subjects* of pastoral poetry, the principal difficulty of this kind of writing occurs. The active scenes of country life will be thought by many, and perhaps not without reason, too barren of incidents. The tenor of the shepherd’s life is uniform, and does not admit of that variety which renders poetry interesting. Hence it is that, of all poems, the most meagre commonly in the subject, and the least diversified in the strain, is the pastoral. Common-place topics have been thrummed over by all eclogue writers, since the days of Theocritus and Virgil; and to this circumstance is owing much of that insipidity which prevails in pastoral composition. But why, says Dr. Blair, may not pastoral poetry take a wider range? Human nature, and human passions, are much the same in every rank of life; and whenever these passions operate on objects that are within the rural sphere, there may be a proper subject for pastoral.

The two great fathers of pastoral poetry are Theocritus and Virgil. In those Idylls of the former, which are properly pastorals, there are many great beauties. He is distinguished for the simplicity of his sentiments; for the great sweetness and harmony of his numbers; and for the richness of his scenery and description. He is the original after which Virgil has copied; but he has followed him with judgment, and in some respects improved upon him. Moschus and Bion, two other Greek poets, have also considerable merit in the pastoral style; and if they want the simplicity of Theocritus, they excell him in tenderness and delicacy.

The modern writers of pastorals have generally contented themselves with imitating the ancient poets. Sannazarus, indeed, a famous Latin poet in the age of Leo X., attempted a bold innovation, by composing Piscatory eclogues; changing the scene from woods to the sea, and from the life of shepherds to that of fishermen. But he has gained no followers among all the moderns. M. Gesner, a poet of Switzerland, has been, in the judgment of Dr. Blair, the most successful in his pastoral compositions. He has introduced into his Idylls many new ideas. His rural scenery is striking, and his descriptions are lively. He presents pastoral life to us, with all the embellishments of which it is susceptible, but without any excess of refinement. The chief merit of this poet consists in his writing to the heart; and he has enriched the subjects of his Idylls with incidents, which give rise to much tender sentiment. Scenes of domestic felicity are beautifully painted. The mutual affection of husbands and wives, of parents and children, of brothers and sisters, as well as of lovers, are displayed in a pleasing and touching manner.

Neither Mr. Pope’s, nor Mr. Philips’s pastorals, do any great honour, in our author’s opinion, to the English poetry. Mr. Gay published his *Shepherd’s Week*, in six pastorals, with a design of ridiculing that sort of simplicity which

Philips and his partizans extolled, and they are an ingenious burlesque of pastoral writing, when it rises no higher than the manners of modern clowns and rustics. Mr. Shenstone's pastoral ballad, in four parts, may justly be reckoned, says Dr. B., one of the most elegant poems of this kind in the English language.

Pastoral writing has appeared in later ages under the form of a regular drama, blending plot, characters, and passions, with the simplicity and innocence of rural manners. Accordingly pastoral has been defined a dramatic piece, in which the persons are clad like nymphs and shepherds, and act their own amours. The scene is always in the fields or woods; whence Tasso calls pastoral "favole boscareccia." Such are the Pastor Fido, of Guarini; the Aminta, of Tasso; the Sylvia, of Mairet, the French poet; and the Comus of Milton, &c. Tasso assumes to himself the honour of having invented pastoral; but the first idea of this kind of drama seems to be Beccari's, who made the first attempt of this kind in 1552. But Tasso's Aminta, which did not appear till the year 1573, effacing what had been done by Beccari, the first author was forgot, and Tasso left as the inventor.

It is certain this kind of pastoral fable, composed according to the rules of the stage, was unknown among the ancients. The Greeks and Latins have indeed introduced shepherds in their eclogues; but these eclogues had nothing theatrical in them: nor were the shepherds ever brought upon the stage.

Tasso's Aminta claims the preference, as it is less intricate in the plot and conduct, and less strained and affected in the sentiments than the Pastor Fido of Guarini. Both possess great beauties, and are entitled to the reputation they have gained. Dr. Blair mentions another pastoral drama, which will bear being brought into comparison with any composition of this kind, in any language; that is, Allan Ramfay's Gentle Shepherd. The characters are well drawn, and the incidents affecting; the scenery and manners lively and just. It affords a strong proof, both of the power which nature and simplicity possess, to reach the heart, in every sort of writing; and of the variety of pleasing characters and subjects, with which pastoral poetry, when properly managed, is capable of being enlivened. Blair's Lectures, vol. iii.

PASTORAL Column. See COLUMN.

PASTORAL Staff. See CROSIER.

PASTORALE, Ital. and Fr, in Music, an air of the pastoral kind, is generally in Siciliana time. "French airs called pastorals (according to Rousseau) are generally in $\frac{6}{8}$ measure, or two triplets in a bar, and in the character of the musette. Italian pastorals have more accent, more grace, as much sweetness, and are less insipid; their measure is always $\frac{6}{8}$." A mistake; the celebrated pastoral at the end of Corelli's eighth concerto, is in $\frac{3}{4}$.

Among French pastorals, they have whole dramas, called *opera champêtres*, the personages of which are shepherds, and the music ought to be suitable to their state, simple and rustic, such as we suppose their manners to be.

A pastoral is also a piece of music, set to words relative to pastoral life, or a melody which imitates the songs of the shepherds, which is equally sweet, tender, and natural. The air of a dance composed in the same character, is also called a pastoral.

PASTORIUS, JOACHIM, in Biography, a writer of history, was born in the year 1610, in Great Glogau, in Silesia. He was brought up to the medical profession, and received the title of honorary professor at Elbing and Dantzic, but the avowal of Socinian principles subjected him to va-

rious ill offices. At length his constancy gave way, and he conformed to the Roman Catholic religion; he was almost immediately ennobled, created apostolic protonotary, advanced to other high offices, and finally made historiographer, secretary, and commissary of the kingdom of Poland. He died at Frauenberg, in Prussia, in 1681. He was author of a number of historical pieces, written in the Latin language, and he published the Aristotelian Ethics of Crellius, with a life of the author, and some orations and poems. Moreri.

PASTRY, that branch of cookery which teaches the preparation of paste, with several savory ingredients of flesh, fruits, spices, sugar, butter, &c.

Pastry is chiefly conversant in the making of pies, pasties, patties, cakes, biscuits, &c.

PASTURE, PASTURA, in our law-books, is any place where cattle are occasionally fed. By which it differs from *pasua*, which is a place set wholly apart for feeding, and never ploughed.

"Pastura omne genus pascendi significat, sive in pratis, sive in stipula, sive in agris, sive in campis: fed pasua est locus principaliter deputatus pecoribus pascendis, ut puta in montibus, moris, mariscis, et planis non cultis nec aratis." Linwood.

PASTURE, Common of. See COMMON of Pasture.

PASTURE, Admeasurement of. See ADMEASUREMENT.

PASTURE, in Agriculture, a field kept fed down by cattle, sheep, or other animals. These differ considerably according to the modes in which they are managed, some being almost wholly appropriated to the fattening of animals, under which system they are termed grazing, or fattening pastures; while those which are almost solely applied to the support of such animals as afford useful products, such as cheese or butter, are denominated dairy pastures. The situations and inclosure of pastures have also some effect on the manner of employing them, the lower and more inclosed kinds being in general more adapted to the fattening system, while the higher are more suited to sheep-pastures. The state of the sward may likewise have some influence in the same way, as the new lays are said to be more proper for the store flock, while the old grafs lands are better for feeding. See the following article.

PASTURE Land, a general name for all sorts of land reserved for the purposes of pasturing and feeding cattle upon. Pasture ground is of two sorts: the one is low meadow land, which is often overflowed; and the other is upland, which lies high and dry. The first of these will produce a much greater quantity of hay than the latter, and will not require manuring or dressing so often: but the hay produced on the upland is much preferable to the other; as is also the meat which is fed in the upland, more valued than that which is fed in rich meadows: though the latter will make the fatter and larger cattle, as is seen by those which are brought from the low rich lands in Lincolnshire. But where the people are nice in their butcher's-meat, they often give a much larger price for such as has been fed on the downs, or in short, upland pastures, than for the other, which is much larger. Besides this, dry pastures have an advantage over the meadows, that they may be fed all the winter, and are not so subject to poach in wet weather; nor will there be so many bad weeds produced; which are great advantages, and which, in a great measure, recompense for the smaller produce of grafs.

The author of a late practical work has stated, that the grounds that are the most perfectly adapted to this use, are all those which have a considerable depth of good mould, and, at the same time that they afford a good herbage, are so dry in their nature, as to admit animals to feed upon them at almost

all

PASTURE-LAND.

all seasons, without injury by poaching. Coarse rusby lands may, however, in many cases, be converted into good pastures, by proper attention in draining, and cutting over the rushes in the early part of the spring, as by this means the water enters their stems, and the plants decay, the young shoots being afterwards eaten by young stock, and the good grass plants allowed to flourish. He likewise adds, that there is also another sort of land that may be employed in this way, which is that of the moory kind, consisting of much imperfectly reduced vegetable matter, proceeding from the leaves and roots of various decayed vegetable productions, that require to be brought into a suitable condition for the support of grass plants by proper drainage, and the application of substances of the fossil kind. And he observes, that pasture lands should likewise, as much as possible, possess properties in the nature of their grasses that are the most advantageous for the particular method of management under which they are to be conducted. In this view, some may be more adapted to the producing of milk and butter, others of cheese, and others again of feeding or fattening animals. It is in some measure on this account, as well as that of local convenience, that different modes of management are employed on grass lands.

And it is suggested, that the difference of situation in pasture lands has likewise much influence in directing the uses to which they may be applied with the greatest benefit. The higher and more elevated grounds being, in general, more proper for sheep, while those of the lower and more inclosed kinds are mostly better suited for the purpose of neat cattle, or other animals under the fattening system. And besides, the age of the lay makes a difference in some cases; new laid-down pasture lands being commonly found more proper for the support of young store animals, while those that have been long in the state of sward, are in general better adapted to the feeding or fattening stock. It is also obvious, that the mode of inclosing has some effect in the same way; as when the inclosures are of a moderate size, they are found more suitable for the purposes of feeding, than where the contrary is the case.

It may be observed, that this sort of grass land, as well as that of the hay kind, is subject to be overrun and much injured in its produce, both by moss, coarse plants, and ant as well as mole-hills. These should therefore be constantly removed, or spread about as soon as possible, and prevented from obstructing the complete pasturage of the lands, in the manner that is recommended under these different heads.

It is suggested, that on the marsh grazing lands in Kent, where ant-hills frequently occur, they have a mode of extirpating them in an easy and expeditious way, and of bringing the surface level at the same time, which is by the use of an implement, eight or nine feet in breadth, which is armed with a sort of strong cutting blade. When in use it is drawn by a horse directed by a boy, and guided behind by a man, and is capable of often cutting off several of the hills at one stroke, and of course of clearing a number of acres in a very short space of time. There are various other implements in use for this sort of work, in different parts of the island, which answer the intention in a very perfect manner.

There can be no doubt that pastures, when not well attended to, must frequently be prevented from being properly fed by various kinds of shrubby plants, such as those of the alder, brier, broom, surze, and other sorts that spring or shoot out upon the surface, and which should always be extirpated as soon as possible, as by remaining upon and shading the ground, they render the herbage sour, coarse, and improper for the food of cattle. This sort of work may be performed by cutting them closely down, as

they rise in the early spring months, by a strong scythe; but a better practice is to dig them or plough them completely out, where it can be done, which should be the case while it is under the state of tillage, in order to its being laid down to the condition of sward.

And the shrubby, black, and other thorns and briars, that spring up from suckers on the sides of the hedge-rows of pasture grounds, should likewise be exterminated, especially where sheep are pastured, as they do great mischief by pulling and entangling their coats. Besides, much ground is often lost in this way, and the appearance of the hedges is disgusting. In many cases, after the plants are stocked up, the earth about them might be thrown into a compost with a small proportion of well-rotted dung, and spread upon the land with much benefit; and at the same time the land thus cleared be brought into a proper condition for being sown down with grass seeds.

Besides, where pasture lands are productive in grasses of the more sharp coarse-bladed kinds, which rise in tufts or tussocks, and such as are known to agricultors under the titles of pink or carnation grasses, and there are other sorts of aquatic plants presenting themselves, it is a certain indication that the soil is too retentive of moisture, and not only stands in need of draining, but also of being kept in a close state of feeding by different sorts of stock, so that every part of them may be kept quite pared down by the animals.

It has been well suggested, that the manuring of pasture lands is a business much less in practice than ought perhaps to be the case; as where the soil is not good, and they are kept in a constant state of feeding or pasturage, it would seem probable that their fertility must in some measure decline, if proper means be not taken to preserve and keep it up, even though they should be fed down with sheep, which is unquestionably, in this view, the most favourable sort of stock. It is indeed hardly to be supposed, that the small proportion of excrementitious matter that is dropped at random during the feeding of animals, especially the larger kinds, under an exposure to the dissipating and washing effects of the atmosphere, at different seasons, where no other sorts of food than that of the natural grasses of the pastures is consumed, can in such sorts of land be adequate to the restoration of the great degree of fertility that is constantly conveyed away in the time of pasturing. In the better kinds of pasture lands, where the produce of grass is considerable, improvement may, and undoubtedly does take place by feeding them, especially by sheep, as the discharges of the animals are not only more abundant, but a proportion of old grass is left to decay during the winter season, and in that way make an annual addition to their fertility. It appears probable to this writer, however it may differ from opinions that have been held on this subject by some cultivators, from much close attention to the management of grass lands of the less rich kinds in the state of pasture; that, in such cases, unless attention be paid to improve their condition by some other means than merely that of the manure dispersed over the land by the animals in simply consuming the herbage, they must in time become gradually deteriorated, and the quantity of pasturage be lessened so as to support smaller proportions of stock than was formerly the case. This supposition seems indeed, in some degree, supported by the condition of downs, and other uninclosed lands, that have been in a state of pasturage for a great length of time; as in these cases, if feeding had rendered them more fertile, they must long since have been enabled to carry a vastly increased proportion of stock; which is certainly not the case, as has been strongly re-

PASTURE-LAND.

marked long ago, by Dr. Anderfon in his useful *Essays on Rural Affairs*.

But that feeding down pasture lands, of these as well as other kinds, in a judicious manner, has the effect of rendering the herbage more fine, and better for the support of stock in general, there cannot be the smallest doubt; though it does not certainly follow that the fertility of the land, in such cases as have been just mentioned, is thereby really improved, as has been supposed by some employed in the business of grazing in particular situations and circumstances. Where the pastures, as has been just observed, are in such heart as to afford a large quantity of herbage for being converted into manure, and sufficient to permit a portion annually to revert to the state of vegetable mould by its undergoing the process of putrefaction, a considerable progressive improvement must, without doubt, be the case under the pasturing system, especially where sheep constitute the principal stock. And in most cases, the fining of the herbage by this practice must be advantageous. It seems, therefore, not improbable, but that the bettering of the condition of the herbage, by feeding the lands with sheep, may have occasionally led to the supposition, that the fertility of the grounds was thereby, in all cases, really improved. That an increase of fertility is produced, in most instances, by the pasturing of lands with sheep, is not disputed; it is only in particular circumstances that the contrary is contended to take place. And in all cases the injury that may be sustained in this way, must evidently be very small, when compared with that which takes place from repeated mowing without the application of suitable dressings to the lands.

The improvement of the fertility of pasture grounds may be effected in different ways, as either by the direct application of manure in its natural state, such as that of rotten dung, lime, marle, or in that of earthy compost, occasionally spread over their surfaces in a thin even manner; or indirectly by the folding or confining of sheep upon the land during the time they consume other sorts of green food, such as turnips, &c. The latter mode is unquestionably the most advantageous and convenient, as it is in but very few situations that the former can be practised without injury to the arable or hay lands. By proper attention in this way the more poor pasture grounds might soon, and at little expence, be brought into a good state of pasturage; which could seldom or ever be the case without some such means of increasing their productiveness.

The writer of the Report of Salop states, that upon upland meadows, the manure from the chaff at the barn-doors mixed with soil, ashes, and shovellings, is very properly applied. But that the farmer's pastures are more neglected than any other part of his land, as very little manure is ever put upon them; they consider it as more wanted elsewhere. All grass lands at a distance from towns are, in general, too much neglected. The barn-door muck and ashes, mixed with the shovellings of roads and cleanings of ditches and ponds, should be more frequently applied to such as cannot be watered. Ponds may be frequently made on the sides of roads and water-courses, to catch the fine soils that are washed down by the rains in winter: this should form part of a compost. It is added that, for the hay fields, which are shut up for a crop at Candlemas, or before; the best time of manuring them is immediately after the hay harvest. Some farmers do this work in winter, when the ground is sufficiently hardened by the severity of continued frost. For the purpose of manuring, the diligent husbandman provides a large compost mixen. With this view he cleanses his ponds, he scours his ditches, he shovels

his fold, he collects his ashes, he sends to the lime-kiln, he provides fern, weeds, stubble, &c.; in a word, he amasses all materials that will increase the bulk, and promote the fermentation, of a general dunghill. Melioration of soil is best obtained by an unremitted attention to this business of manuring. Hereby the quantity of grass is greatly increased, and the quality of it much improved. Two tons of hay *per acre* is produced instead of one, and trefoil and white clover flourish and abound instead of moss and rushes. And for the improvement of pasture as well as meadow-lands, it is advised to suffer no weeds to seed, nor mole or ant-hills to continue; the land to be either mowed or grazed bare once in every year. Such as is mowed should be manured in the autumn of every second year with dung or compost, consisting of dung and earth or mud, at the rate of about ten cubic yards to the acre. Close attention should be paid to examining the streams of water, by the assistance of the spirit level, for generally the water from the summits will be found to cover much more land than is expected; and where it takes its course through several properties, it may be agreed to be used to the mutual benefit of the owners, by stipulating the times for each to use it, in due proportion to the quantity they respectively have suitable to that purpose. He knows of no improvement upon grass land (after being drained when necessary) greater than this, though but little attended to in comparison of the large tracts that may be improved. See *AFTER-GRASS* and *MEADOW*.

PASTURE Lands, Stocking of, the art of eating them down with the greatest economy and advantage by one or more sorts of live stock. This is a point of management in grass husbandry that has hitherto been but little attended to by farmers in general. It is obvious, however, that a great deal must depend upon its being judiciously performed, both in respect to the improvement of the stock, and the lasting of the grass, as, under some circumstances, much more waste will be incurred than under others. A practical writer has observed, that the most proper period for turning the stock into the pastures in the spring season has been a matter of dispute among those employed in the management of grass lands; some contending, that it should be done early, before the natural grass has risen to too great a bite, while others maintain the contrary opinion. And that there are probably inconveniences attending each of these extremes, as in the first the stock, especially when of the fattening kind, may sustain injury from the want of a sufficient bite to permit the animals to fill themselves in an expeditious manner; and in the latter, there may not only be much waste by the stock not being capable of keeping it under, but great loss and inconvenience from its running up in tufts to feed, and by that means rendering the pasture patchy and unevenly fed down, by which the extent of real pasturage is lessened. That it has been also observed by Mr. Marshall, in his *Rural Economy of Yorkshire*, that by turning the stock upon the pastures when there is a full bite, the better sorts of grasses are only consumed, the more coarse herbage being rejected and let run to seed, by which the lands are greatly injured at the time as well as in future; while, on the contrary, if the stock be allowed to enter during the time such coarse plants are in their more tender early growth, and before the pasture is covered with better herbage, the whole of the other plants will be fed down in a regular manner with the grass. And that the want of a full bite on the first turning out of the store stock is of advantage to the animals, as they become more gradually accustomed to the change from dry food to succulent herbage. And it is supposed that fattening stock only

PASTURE-LAND.

only require a full bite on being at first put upon the pasture. The first of these writers further states, that in answer to the objection that has been made, that early turning upon pastures exposes them more to the effects of drought in the spring months, it is said, that it is in a great measure ill founded, since cattle milk and thrive well in such cases. It is not, Mr. Marshall remarks, the length of grass, but the quantity of nourishment which it contains, that makes cattle pay for their pasturage. And it is not supposed improbable, but that the richness of the herbage may in some degree depend on the sun or heat of the season. Facts and observations are however here much wanted, as little, till within these few years, has been attempted in respect to the most advantageous system of feeding down pastures. The former of the writers, whom we have just mentioned, has observed, that as the state of the grass, which is the most favourable to the feeding of the stock, and their expeditious filling themselves and taking their rest, as well as that of their wanting the least possible proportion of the food, would seem to be that of a middle degree of growth; it is not improbable, but that that may be the most proper and advantageous period for breaking the pastures; the exact time of which must obviously be regulated by the nature of the soil, the situation of the land, and the state of the season, as well as the circumstances of the farmer; but that from the end of March to the latter end of April, or beginning of the following month, according to the forwardness of the season, may be the most advantageous in the southern districts, while in those of the north it may be deferred a week longer or more with propriety and advantage in many cases.

In regard to the general eating down of pasture lands, there is much difference of opinion, some advising that it should be done in as close a manner as possible, others, that this should never be the case. It would seem, however, that the closeness or degree of feeding that is the most proper should be directed by the nature of the grass and the time at which it is performed, as where the herbage is of the coarser kind and consumed in the autumnal season, it may be done much more closely than in the contrary circumstances, as such sorts of grass must always be improved by such close feeding, and no injury can be sustained at such seasons from the roots of the grasses being left so much exposed, which would be the case in the latter spring or early summer months, from the constantly increasing heat at such periods. The advice, that has been given by an intelligent observer on this subject, may in general be adopted with propriety, which is, to be cautious not to overstock, as by that means great loss may be sustained, as land when fed too bare is apt to burn in the summer and to be chilled in the winter. Besides, the necks of the roots are so injured by very close biting, that they do not afford so quick or free a spring or growth to the succession of blade as there would otherwise be. But, on the other hand, it is not recommended to leave a long bite of grass on the land: a middle degree will suit all lands the best, and afford the most benefit to the persons who occupy them. This advice of Mr. Kent's deserves to be well attended to, as being founded in real practice.

It has been further stated, that by the too thin stocking of pastures, though loss may be sustained in their not supporting the proper number of animals, as well as from the injury which is done by the grass plants running so much up to stems, the broken grass, in such cases, can be mown when in sufficient proportion for hay; but the disadvantages of over-stocking are scarcely capable of being repaired, according to Mr. Marshall, as besides the lands being often ex-

posed to much injury by the crowns of the plants being so closely pared down, especially in the finer kinds of grass, the cattle, from suffering a check in their feeding, are long in regaining their former thriving disposition; that, of course, almost the whole of the produce of pasture lands may, in this way, be often thrown away, and that it is an error that young farmers are extremely liable to fall into. It is therefore obvious that the medium degree of stocking, which has been advised above, is, in general, to be carefully adopted from the experience obtained upon the land; in the procuring of which it is best to begin by an under proportion of stock, that the effect may be the better perceived.

Among graziers there has been a considerable difference of opinion in respect to the manner of stocking, or feeding down such lands; some contending that it should be done with only one sort of stock, while others suppose that they should be mixed, in order to produce the best effects both on the lands and stock; Mr. Kent has supposed that the more various the kinds of cattle are that are fed upon the pastures at different times, the better. But it has not been shewn, the author of *Practical Agriculture* says, on what principle this advantage depends. If the different modes of feeding in the different animals be attended to, and minutely examined, it will be found that though some sorts may consume grass when in a more luxuriant state of growth than others, they are all fondest of pasturing on that which is the most sweet and tender. This is rendered extremely obvious by the observations of an attentive inquirer, who has found, that although horses appear partial to particular patches of sward, he has never been able to discover any peculiarity in the soil or the herbage of such barely eaten spots. It has been supposed that they have been fed down by such animals at first in so close a manner merely by accident, but that afterwards they are kept in such a close state of feeding from their peculiar sweetness depending on the peculiar shortness of the herbage. It would, however, seem more probable, from the circumstance of the animals being almost wholly directed by the taste in the choice of their food, that the sweet or tender nature of the herbage in these parts first induces them to feed upon and consume them in so close a manner, as well as the continuing the close eating them down afterwards. The same thing is observed to happen in the vicinity of preserved covers, with hares and rabbits, from their keeping spots of barley or other grain crops closely fed down. And sheep are well known to ramble over the whole of the pastures in order to nibble and pick out the most sweet and delicate morsels. The feeding of neat cattle is, perhaps, less particular and delicate in this respect; but where not forced by hunger they mostly appear to fix upon such parts of the land as possess the most sweet and palatable herbage, rejecting the coarser spots where it is less tender and agreeable. It is contended that, if the conclusion be therefore well founded, that stock of all sorts prefer the best, sweetest, and most tender herbage, it is evident that no mixture of animals can insure the even and regular feeding down of pastures, as they will, in some degree, be all attracted by the sweetest and most tender parts, and those of the more coarse four kinds be in consequence almost wholly rejected. An agricultor of great experience and nice observation, the Rev. Mr. Clove, has remarked, that in pastures, stock naturally pick the most palatable grasses first, leaving the others to run up to bents; and though it is admitted that one sort may have a preference for one species of grass, and another for another, there is no mixing the animals in such a manner as to prevent this circumstance from taking place. It is wholly impracticable to proportion each kind of stock in such a way to the species of grass that may be most agree-

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PASTURE-LAND.

able to it, as to prevent the scarcity of one sort and the abundance of the other. It is of course obvious, that there are therefore not only difficulties in the regular feeding down of pastures, from the cattle being more fond of some sorts of herbage than others, but also from the inability of the grazier to proportion them in a way that may fully answer the purpose which he has in view. These observations, at the same time that they shew the difficulty of the business, convince us of the advantage and importance of keeping pasture lands regularly and evenly fed down, which is perhaps only to be fully effected by one sort of flock properly succeeding another, till the want of the finer sorts of herbage obliges them to feed upon those that are of a more coarse nature. In this, as well as other views, the fattening flock should be first turned into the lands, and kept upon them so long as they continue to improve in a proper manner; they may then be succeeded by the older sorts of cattle that require to be brought into condition, and the more young store flock may consume the remainder of the grass, according to the intentions of the farmer. That great utility and advantage may be derived from often shifting the cattle, by having recourse to a *head* flock and proper *followers*, there can be little doubt. The few writers that have touched upon the subject of grass husbandry, have, in general, indeed, recommended the practice as highly beneficial both in respect to the pasture and the flock. And Mr. Marshall, in his *Rural Economy of Yorkshire*, speaks of this being a defect in the grass land management of that district. The correct grass farmer should, therefore, be more attentive to this part of his management than is commonly the case, taking care that the changes of his stock are made in a seasonable and judicious manner, and without either the stock or the land suffering any injury from it.

It is suggested that this is probably a practice from which greater utility may be derived than that of permitting many different sorts of stock upon the ground at the same time, as, besides their not answering the intention of feeding the pastures down with more regularity and evenness, they are inconvenient and disadvantageous in other respects. For when the pastures are fed down with a mixed stock, the animal's seldom thrive or fatten so well as where the contrary is the case. They are too much driven about and disturbed by the different kinds teasing each other, especially where horses and neat cattle are put together. A mixed flock is also improper in another point of view; many sorts of animals feed closer and more expeditiously than others; of course, when there happens to be any scarcity of feed, some of the kinds may be greatly injured from the want of proper support. The horse, like the sheep, feeds close and quick, while the contrary is the case with the cow; it would of course seem improper to mix horses with neat cattle in the pasturing of grass lands, though the practice has been prevalent in many places. It has indeed been observed, that sheep and horses may feed and thrive best together, both from the similarity of their manner of eating and that of the former consuming the rich luxuriant herbage which springs in consequence of the manure dropped in the season, while the latter prefer the less vigorous, but the more clean grass. It is a practice, however, that has sometimes been found useful to mix sheep with neat cattle. The notion of deriving advantages from the mixing of stock, from the circumstances of some sorts having a greater dislike to feed near their own dung, and less towards that of others, is probably not founded on just observation, as animals have a fixed aversion to both their own and that of other animals, and none of them will feed near either till compelled by the scarcity of food. This aversion does not perhaps depend wholly on

the dung, but it is in some measure avoided in consequence of the grass becoming rank and coarse about such places, and of course more sour and unpalatable to the animals.

But very little attention has, till lately, been bestowed upon the manner or state of feeding down grass lands, the business being mostly left to chance, accident, or the caprice of the farmer. It is, however, obviously a matter of vast importance, not only in so far as it respects the economy of the pastures, but the success and proper progress of the flock that consume it; as by improper management that proportion may be wastefully eaten down in a short space of time without the stock being brought more forward, that under a better system would last out a longer time with a greater increase or progress in the animals that feed upon it. And that, as it is a matter of consequence to keep pastures and grazing-grounds as even as possible, a proportion of stock fitted to produce this purpose should always be put upon the lands. On the rich and more fertile kinds where the grass springs quick and in great abundance, more stock will be necessary to effect this purpose than where the contrary is the case. It has been found, on the marsh lands in Lincolnshire, that where the most grass is left in the autumn the herbage is the coarsest and the worst in the succeeding year. In the extensive feeding tract of Romney Marsh, the close feeding system is also found to answer in the most perfect manner. These facts shew the necessity of hard stocking on the richer descriptions of land. In other parts of the first of the above districts, on turning upon a full bite in the spring, they flock in such a manner as to prevent the grass from becoming coarse by running up to stem. The necessity of sweeping over the rough tufty parts by the scythe is thus avoided, except in very wet seasons. And it is a practical remark of a cautious observer, on describing a field not sufficiently stocked, that on the marsh just mentioned, the grazing farmers would be ruined if they suffered so much grass on their lands. It seems to be a bad practice to allow the grass in pastures to advance to such a state as to require to be swept over by the scythe, though it may be right to do it under such circumstances, in order to prevent the greater injury that might otherwise be produced. It appears extremely probable, indeed, that by permitting the grass plants to run up to seed-stems, the pastures may sustain vast injury, not only by the exhaustion of the soil that takes place during the efforts of the plants to form and fill the seeds, but in consequence of their whole vegetative powers being directed to that purpose, from their sending forth few or no leaves. This is extremely evident in all the coarser sorts of grass plants, and fully explains the utility of keeping them closely fed down, as by such means a more abundant grassy herbage is provided for the support of stock. There are various observations that seem to support this opinion. Thus it has been recommended to stock pasture lands in such a manner as will keep the grass in a young succulent state; as in this way there is a benefit, by the whole of the produce being consumed, and at the same time the stems of the grass plants are prevented from seeding, which exhausts the roots and the lands; the soil is of course preserved in a better state of fertility, more shoots are thrown out, the sward is rendered more close, and a more constant verdure kept up.

Therefore the true principle of grazing, in the opinion of this writer, is to eat *all*, and particularly at those seasons when vegetation is rapid, that it may not weaken the turf and soil, but by keeping the grass in a young state, have the shoots more vigorous.

And it is practically remarked, that, as for the purpose of feeding the larger sorts of neat cattle, it is necessary for the

PASTURE-LAND.

the grafs to have grown to a pretty full bite before they are turned in, and of courfe numerous feed-ftems to be formed; it feems not improbable, but that the fuperior benefit of feeding with fheep may depend upon the circumftance of their eating more clofely, and thereby preventing fuch effects from taking place. That of courfe, in the ftocking of paf-ture grounds, the growth of the grafs fould be particularly attended to, and the proportion of flock adapted to it; care being always taken to have a full proportion during the fummer months, from May to Auguft; a proper referve being then made for the winter feafon; as Mr. Price has well fuggel- led, in this bufinefs, that the farmer fould be as careful as poffible to neither over or under-ftock, as by either means he muft fuftain lofs and inconvenience, in the different refpects that have been already noticed.

But on this interefting point of management there is another matter, upon which farmers have differed very con- fiderably in their opinions; each contending, as in many other cafes, for the propriety of their praftice, on the ground of experience. It is that of giving the flock, of whatever fort it may be, the whole range of the lands, how- ever extenfive, at once; or having them divided, fo as to let it have the grafs at different times, in a frefh, unbroken, and untrampled ftate. This is a queftion, which, from its involved nature, and from few experiments having been made directly in refpect to it, that is not readily decided; yet much in the economy of feeding down grafs land depends upon it. The obfervations of Mr. Young may perhaps throw fome light upon it. When cattle, whether cows, fattening beafts, or young flock, are turned out to grafs, it is requifite to confider the beft method of feeding. There are two opinions on this point directly contrary to each other. Firft, it is affirmed by one fet of graziers, that, let the grafs to be fed confift of ever fo many acres, the cattle fould have it all at once: if it is divided into eight or ten fields, the gates of all to be fet open, for the flock to feed where they like. Secondly, thofe of the other fet advance, that large fields of fifty, eighty, or an hundred acres, fould be divided, that the farmer may change his flock from one to the other, and give the grafs frefh and frefh. And each of thefe parties affert, that they know themfelves to be right from experience. But that is impoffible: one muft undoubtedly be wrong. Let us confider the point from reafon: it is one that will never be decided fairly from experiment; for two pieces of grafs, each of eighty or an hundred acres, contiguous and perfectly alike, are not to be met with in the king's do- minions; and, if they were, two fets of flock, exactly fimilar, would not be found. The divifions into fields by hedges and ditches, for the purpofes of draining and fhelter, is not the inquiry, the comparifon not being fair; as fuch divifions may be fed at once, by fetting all the gates open, as well as one field. The inquiry is, whether the cattle will fpoil the grafs more in one way than in the other? and whether the grafs will go as far in one as in the other, by fattening and feeding the beafts as well? The argument of giving the grafs frefh and frefh appears to be rather vague; for it fup- pofes that the cattle will not eat it frefh, if they have the whole range at once, which may be a miftake: they will not be feen in the evening where they were feeding in the morning, but vary their food in the manner moft agreeable to themfelves; and we may in general obferve, that the fa- gacious animals, when left to their own conduct, manage fuch points better than we can for them. As to the tread- ing and fpoilage, it is an equal objection to both methods; the legs of the beafts are not tied in fmall clofes, any more than in large ones. In cafe all the fmall pieces have not

water, the objections to feeding them feparate are much greater.

On the other hand, it muft be admitted that there are dif- advantages attending this way of pafuring: for a time the trampling may be greater, as cattle are difpofed to beat a fort of march around the fields, on firft turning in, and alfo on fome kinds of difturbance. But the greater evil is that of difturbance a large herd, inftead of a fmall one: this a dog may effect in one inclofure, unfeen from others, and con- fequently the flock in them left without interruption; and, perhaps, a motive greater than this is, its having been ob- ferved that cattle, and fheep alfo, do better when well pro- portioned to their pafure, when divided into fmall lots rather than large ones.

Mr. Young here leaves the matter without any decifion. There are, however, a variety of circumftances that would feem to fhew the mode of feeding in divifions to have the fuperiority over that of turning upon the whole at a time. There can be no doubt but that much greater wafte of grafs is made in turning upon the whole at once, efpecially if the full proportion of animals for the land be put in; as it muft be well known to the praftical farmer, that when grafs has been once trampled upon, flock of all forts reject or eat it with great reluctance. And in cow farming, where vaft numbers are often turned upon the land at one time, in order to procure the greateft poffible abundance of milk for a fhort period, as is frequently the cafe near London, and other large towns, no one can have avoided obferving the uncom- mon lofs and deftruction of food that is the confequence. The writer has attended to many circumftances of this na- ture, in which he is convinced that the fame proportion of flock might have been equally well kept for one-fourth of the time longer, by having the grafs confumed by the fame flock in fuitable divifions.

It is ftated by a writer in the third volume of the Farmer's Magazine, that in the management of pafurage, he would carry on a fucceffive flock, and a feries of pafure fields, fo as to give three fifts. Thus, the fattening flock is to get the top of the pafure firft broken upon. Before the pafure is eaten too bare, this flock is to be removed into a fecond field of frefh grafs, and is to be followed on the firft field by the keeping flock. Before the fecond field is too bare, the fatteners are to be removed into the third, and the keepers into the fecond. While thefe two flocks are employed in this fift, in eating the fecond and third fields, the firft field has time to get again into full herbage. It is certainly, he thinks, needlefs to enlarge on this courfe, as the principles and praftice are both fufficiently obvious.

And in a late praftical work it is noticed, that the ex- perience of a writer, who has examined grafs hufbandry with much minutenefs and attention in different diftricts, would feem alfo, in fome meafure, to favour the fame conclufion, while it fhews the benefit of one fort of flock following another; as he advifes that, in all cafes where fattening cattle or dairy cows conftitute a part of the flock, and where foil, fituation, and water will admit, every range of grazing lands fould have three divifions; one for the head flock, as the cows and fattening animals; another for followers, fuch as the rearing or other lean flock; and a third for being preferved in order to frefhen, for the reception of the prin- cipal flock. Befides, he is decidedly of opinion, that whether the ground may confift of one, two, or a greater number of divifions, not a weed fould be fuffered to feed, or a tuft of ftale grafs to ftand on it; but once, at leaft, in the fummer feafon, be levelled down by the fcythe; as, by fuch means, weeds may be converted into nourifhment, and

PASTURE-LAND.

waste into after-grafs. But it has been seen above, that by proper stocking, there need not be any necessity for the operation of the scythe; as the practice of close feeding renders it unnecessary, and at the same time affords a superior advantage to the grazier.

The proportions of stock of different sorts, that can be properly supported on any given space of pasture ground, must vary considerably, according to the natural goodness of the soil, the properties of the grafs, and the differences in the sizes of the animals. And there is likewise another circumstance which should be attended to, which is the length of time the land has been in the state of sward; as new lays are seldom capable of carrying so much stock on the acre as those of the older kinds. But it is also a point that ought to be attended to, that those lays should be stocked as much as possible with sheep.

Mr. Young advises, that, in the stocking of grafs lands, the farmer should attend well to the proportion between his stock and the quantity of his feed. Let him remember, when he stocks his grounds, that he should be pretty nice in this proportion: for if he overstocks, his loss will be certain and great; and if he does not throw in as many cattle as he ought, then he will suffer in his profit.

The exact number of animals, whether of the cattle or other kinds, that may be grazed on the acre, is not easily ascertained, so as to avoid leading the farmer into error, as it will differ so greatly in different situations and circumstances. Besides, it is unnecessary, as the proportion of different sorts of stock that may be admitted upon grazing lands, in different districts, has been shewn, in speaking of the manner of feeding or fattening animals at grafs, in considering the practice of grazing. See *GRAZING*.

Lands employed for the purpose of pasture are frequently occupied by stock during the autumn and winter, as well as the spring and summer months: it is, however, only those of the very dry kinds that can be turned upon in the winter season, especially by heavy cattle; and it is probably, in all cases, a much better practice to confine that sort of stock wholly to the fold-yards at such seasons, as by suffering them to be turned upon the pastures, there must be a great loss in the waste of manure. And it has been found an advantageous practice by some, to shut up their pastures late in the autumn, according to the state of the grafs, and other circumstances; eating them down as close and evenly as possible, previous to the stock being removed; and keeping them perfectly free, till they are wanted for ewes and lambs in the early part of the year, or for cattle at a later period, as when the first shoots appear in the spring, which, from being intermixed with those of the autumn, are supposed to afford more nourishment for the support of the stock, than when either of them are eaten separately.

In the Agricultural Report of Perthshire, it is advised that, in fields that are pastured by cattle, care should be taken that all such plants as are hurtful to stock be completely eradicated from them; as much injury is often done by them to the cattle, as well as the products which they afford. The plants most prejudicial in this way are those of the hemlock, henbane, nightshade, and yew kinds. It has been suggested, that while the grafs is plentiful, there is not much danger of their feeding upon such plants; but when it becomes scarce, and they are confined, it is likely to take place, especially in the spring season, when they are fond of devouring young shoots of almost any kind. And a writer in the Farmer's Magazine strongly advises the following practice, which he has uniformly followed himself, and is thoroughly sensible of its beneficial effects: it is re-

gularly to cut down all weeds, that spring up in the fields, in spite of the stock, before they get into seed. This is by no means expensive, as two or three children are sufficient to keep down the weeds of a large pasture farm. And it is an old and true proverb in husbandry, that "once feeding causes seven years' weeding."

It is indispensably necessary to attend to the circumstance of pastures being well supplied with water, as, without having this in some degree at command, it is impossible that the stock can thrive well, or answer in the most perfect manner in other views. Where they are not, therefore, supplied by brooks or streams running through them, it will be necessary to have recourse to the forming of ponds or pools for the purpose in the fields. And in situations where the natural stratum of the clay is of considerable thickness, there is little difficulty in the constructing of such watering ponds, so as to be perfectly retentive or water-tight; but in loose porous soils, the business is not executed without considerable care and attention, as well as much art. See *WATERING Ponds*.

It is advised, in the Treatise on Landed Property, that in laying out perennial pasture lands, as those of grazing and cow grounds, attention should be particularly paid to the circumstance of water; and that wherever good water is naturally found, or can be brought conveniently by art, to that point the pasture grounds ought to tend, in order that they may have a due supply of so necessary an article to the pasturing of them with cattle.

The first improvement of upland pasture, before eating it down with stock, when not inclosed, is by fencing it in, and dividing it into small fields of four, five, six, eight, or ten acres each; planting timber trees in the hedge-rows, which will screen the grafs from the dry pinching winds in March, which prevent it from growing in large, open, exposed lands; so that, if April proves a dry month, the land produces very little grafs: whereas, in the sheltered fields, the grafs begins to grow early in March, covers the ground, and prevents the sun from parching the roots, whereby it keeps growing, so as to afford a tolerable bite, if the spring should prove dry. But, in fencing in the land, it must be observed not to make the inclosures too small, especially where the hedge-rows are planted with trees; because, when the trees are advanced to a considerable height, they spread over the land, and, where they are close, render the grafs sour, and in that way, instead of being of advantage, greatly injure the pasture. A second improvement of upland pasture is that of making the turf or sward good, where, either from the badness of the soil, or for want of proper care, the grafs has been destroyed by rushes, bushes, or mole-hills. Where the surface of the land is rough, clayey, and cold, it may be best improved by paring it off, and burning it in the manner directed under that head, breaking it up, and then laying it down again to sward; but if it is hot sandy land, then chalk, lime, marl, or clay, are very proper manures to apply upon it: but this should be laid in pretty good quantities, otherwise it will be of little service to the land. Where the ground is over-run with coarse plants, as rushes, &c. it will be a great advantage to it, to cut or grub them up towards the latter part of summer; and, after they are dried, to burn them, and spread the ashes over the ground just before the autumnal rains; at which time the surface of the land should be levelled, and sown with grafs-seeds, which will come up in a short time, and make good grafs the following spring. So also, when the land is full of ant-hills, these should be pared off as above, and either burnt for the ashes, or spread immediately on the ground, when

when they are pared off, observing to sow the bare patches with grafs-seeds in the autumn. See *ANT-Hill*.

And where the land has been thus managed, it will be of great service to roll the turf, in the months of February and March, with an heavy wooden roller, in moist weather, that the roll may make an impression; this will render the surface level, and cause the turf to thicken, so as to have what the people usually term a good bottom. The grafs will likewise be sweeter, and bad weeds be destroyed.

Another improvement of these pastures is, by judicious feeding as above. Where this is not practised, the land must be manured at least every third year: but where a farmer has much arable land in his possession, he will not care to part with his manure to the pasture. Therefore every farmer should endeavour to proportion his pasture to his arable land, especially where manure is scarce, otherwise he will soon find his error; as the pasture is the foundation of all the profit which may arise from the arable land.

But whenever such upland pastures are to be mended by manure, there should be a regard had to the nature of the soil, and a proper sort of manure applied; as for instance, all hot sandy lands should have a cold manure; neat's dung, swine's dung, and earthy composts are very proper for such lands; but for cold lands, horse-dung, ashes, and other warm manures are more proper. And when these are applied, it should be done in autumn, before the rains have soaked the ground, and rendered it too soft to cart on; and it should be carefully spread, breaking all the clods as small as possible, and then harrowed with bushes, to let it down to the roots of the grafs. When the manure is laid on at this season, the rains in winter will wash down the valuable parts, so that the following spring the grafs will receive the advantage of it. And there should also be great care had to the destroying of weeds and coarse plants in pastures every spring and autumn as above; for where this is not practised, they ripen their seeds, which spread over the ground, and fill it so as soon to overpower the grafs, and destroy it. Besides, it is very difficult to root them out, after they have gotten such possession. But in these pastures, the grafs seldom degenerates if the land is tolerably good; whereas in the low pastures, which are overflowed in winter, in a few years it often turns to a harsh rushy nature.

Perhaps there is no part of husbandry, which, till of late, farmers were, in general, more ignorant of, than that of the management of pastures; most of them supposed, that when old pastures were ploughed up, they could never be brought to have a good sward again; of course their common method of managing their land, after ploughing, was to sow, with their crops of barley, some grafs-seeds, as they call them; that is, either red clover, which they intended to stand two years after the corn was taken off the ground, or rye-grafs mixed with trefoil; but as most of these are but biennial plants, whose roots decay soon after their seeds are perfected; so the ground, having no crop upon it, was again ploughed for corn; and this was the constant round which the lands were employed in by most farmers: they had not any notion of laying down their lands to grafs for any longer continuance. Modern husbandry has, however, shewn that it is possible to lay down land, which has been in tillage, with grafs, in such a manner, as that the sward shall be as good, if not better than any natural grafs, and of as long duration. See *LAYING down to Grafs*.

In the improvement of wet pastures, it has been suggested that, the first thing to be done is, to make large deep ditches round every field, and if the fields are large, to divide them into smaller, of five, six, or seven acres each, by new ditches; nothing is attended with a more sudden improve-

ment of all the ground near the borders of the fields than good ditches. They are generally made six feet deep perpendicularly, seven wide at top, and three at bottom. They should be made in such a manner that no water can remain in them, but have a descent from one to another to carry it quickly off. As soon as the ditching is done, the next work is to land-drain the whole fields in such a manner that every part of them may be laid dry. If there is the least fall in any part, or any place more wet than another, the drains should be cut through them. If the surface be exactly level, the depth of the drains should vary, so that the water may every where have a descent. These drains are made, in general, thirty-two inches deep, twenty inches wide at the top, and four wide at the bottom. They are filled eight inches deep with either stones or wood; but the former are the most effectual and lasting to those who are not desirous of saving the difference of expence. However, wood answers extremely well in many cases. See *DRAINING of Land*, and *WATER, Removing of, from Land*.

The prodigious advantage of these drains appears the very first year, especially if the season proves wet; the grafs being fresh, vigorous, and sweet. And the materials taken out of the ditches should, after being well mixed with dung, or some other manure, be spread evenly over the surface of the ground. The expence of this sort of improvement will vary greatly according to the nature of the land, the situation, and other circumstances.

PASTUS, the procuration of provision, which the king's or lord's tenants are bound to make for them at certain days or seasons, or as often as they make a progress to their lands.

This, in many places, has been converted into a pecuniary fee; as in the procurations of the clergy.

PASTY, in *Cookery*, a work of pastry; being a preparation of some proper meat, as beef, venison, lamb, or the like, well boned, beaten up to a pulp, and highly seasoned; put up in a paste, and then baked in an oven. They also make veal patties, umbel patties, kidney patties, marrow patties, &c.

PASZBERG, or PAS, in *Geography*, a town of Istria; 25 miles S.S.E. of Trieste.

PATA, a town on the N. coast of the island of Luçon. N. lat. $18^{\circ} 15'$. E. long. $121^{\circ} 20'$.—Also, a small island in the Sooloo Archipelago. N. lat. $5^{\circ} 45'$. E. long. $121^{\circ} 10'$.

PATA, in *Ornithology*, the name by which the Portuguese in Brasil call a large and very beautiful American duck, known among others by its Brasilian name, *ipccatiapoa*.

PATABEA, in *Botany*, a plant described and figured by Aublet, the derivation of whose name we are unable to trace. Jussieu considers the genus as allied to *Lonicera bubalina* of Linnæus. Aubl. Guian. v. 1. 110. t. 43. Juss. 208. Lamarck Dict. v. 5. 52. Illustr. t. 65.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Rubiaceæ*, Juss.

Gen. Ch. Cal. Perianth superior, of one leaf, turbinate, with four, acute, little teeth. Cor. of one petal; tube oblong, inserted into the disk above the germen; limb cloven into four, oblong, acute lobes. Stam. Filaments four, short, inserted into the tube at its throat; anthers oblong, two-celled. Pist. Germen inferior, firmly united to the bottom of the calyx, crowned by the disk; style oblong, cloven; stigmas two, obtuse. Peric. and seeds unknown.

Ess. Ch. Calyx four-toothed. Flowers in little heads, which are scaly on the outside. Corolla tubular, four-cleft. Anthers nearly sessile.

1. *P. coccinea*. Aubl. Guian. t. 43.—Native of woods and forests in Guiana, particularly at Orapu, where it flowers

in the month of June. The *stem* of this shrub is four or five feet in height, furnished with numerous *branches* even to its summit, scattered in all directions; the smaller ones knobbed and opposite. *Leaves* opposite, stalked, oval, smooth, pointed, paler beneath. *Stipules* two, oblong, acute, at the base of each footstalk. *Flowers* red, in a terminal head, separated from each other by little scales.

PATACA, in *Commerce*, coins of Brasil, of 600 and 640 rees' value, which are current only in that country, and whose intrinsic value is 10 *per cent.* less than that of the Portuguese coins. The Spanish patacas, or dollars, are reckoned in Lisbon at 830 rees, more or less. The assay of the old pataca of Brasil, of 640 rees, is worse than the English standard, being 2 dwt.; its weight is 12 dwt. $4\frac{3}{4}$ gr.; its content in pure silver grains is 268.3; and its sterling value 3*s.* 1 $\frac{1}{2}$ *d.* The pataca of 600 rees (1755) is 4 dwt. worse than the English standard; its weight 11 dwt. $7\frac{1}{2}$ gr.; its content in pure silver grains 246.4; and its sterling value 2*s.* 10 $\frac{1}{2}$ *d.* The assay of the pataca of 640 rees (1768) is $4\frac{1}{2}$ dwt. worse than the English standard; its weight 11 dwt. $9\frac{3}{4}$ gr.; its contents in pure silver grains 247.8; and its sterling value 2*s.* 10 $\frac{3}{4}$ *d.* The assay of the pataca of 640 rees (1801) is 7 dwt. worse than the English standard; its weight 12 dwt. $4\frac{3}{4}$ gr.; its content 262.2; and its sterling value 3*s.* 0 $\frac{1}{2}$ *d.* the half, quarter, &c. pieces are in proportion. The impression on the pataca is the arms of Portugal, with 640 on the side, and the date near the top; legend, the name and title of the reigning sovereign, with the addition of BRAS D. *Brasilie dominus* or *domine*, lord or lady of Brasil; reverse, an armillary sphere, placed on a cross; legend, SUBQ. SIGN. NATA STAB.; *i. e.* SUBQUE SIGNO NATA STABIL; born under a steady sign. There is a pataca of 600 rees bearing the letter J, with a crown over it, 600 on the side, and the date at the bottom; reverse, an armillary sphere, with an R in the centre.

PATACA is also the name given to the German dollars in Egypt; which formerly passed for 85 medini, but have been raised to 90 medini. In making bargains, however, where patacas are to be received in payment, it is necessary previously to settle the value of the coin.

Contracts also at Grand Cairo are made in funducli and Mahhub sequins. The funducli are reckoned at 146 medini; and three Mahbubs are equal to four patacas, so that the Mahhub is worth 120 medini.

PATACA Chica and **PATACA Gourda**, two monies of account at Algiers, the former being eight temins or 232 aspers. The pataca chica is worth 11 $\frac{1}{2}$ *d.* sterling: the pataca gourda, or piaſtre, contains three patacas chicas, a Sultanin passes for 8 $\frac{1}{2}$ patacas chicas, more or less, a sequin for 10, and a Portuguese dobraon, or Joaneſe, of 6400 rees, for 36. A Spanish dollar is worth from 4 $\frac{3}{4}$ to 4 $\frac{7}{8}$ patacas chicas.

PATAK, in *Geography*, a town of Hindooſtan, in Palnaud; 20 miles W. of Timerycotta.

PATACON, or **PATAGON**, in *Commerce*, a silver coin in Switzerland, and also at Liege in Germany. The patacon of Bern consists of 3 livres 6 sous, or 33 batzes; the livre, according to the Tariff of 1755, being equal to 1*s.* 2 $\frac{1}{2}$ *d.* sterling.

The patagon, or ecu, of Geneva, which is sometimes used in accounts, is a real coin, worth 3 livres, or 10 $\frac{1}{2}$ florins.

The patagon, or crown of Bern (and the half in proportion) appears by the assay to be 7 dwt. worse than the English standard; 18 dwt. 22 gr. in weight; its content in pure silver 411.5; and in value 4*s.* 9 $\frac{1}{2}$ *d.* sterling. The old patagon, or ecu, of Brasil, is 14 dwt. worse than the English standard; 18 dwt. 4 gr. in weight; in content of pure silver 377.9;

and in value 4*s.* 4 $\frac{1}{2}$ *d.* sterling. The patagon, or ecu, of 1795 (the double and half patagons, and six-dollars in proportion) is 1 oz. 0 $\frac{1}{2}$ dwt. worse than the English standard; in weight 16 dwt. 14 gr.; in content of pure silver 329.3; and in value 3*s.* 10*d.* sterling. The patagon of Geneva is 1 oz. worse than the English standard; in weight 17 dwt. 9 gr.; in content of pure silver 351; and in value 4*s.* 1*d.* sterling.

The patacon of account at Liege is 4 florins, 8 escalins or schillings, or 80 stivers. The patacon is also a silver coin of 4 $\frac{1}{2}$ current florins, or 8 $\frac{1}{2}$ escalins. The patacon weighs 429 $\frac{1}{2}$ English grains, and is 20 oz. 8 $\frac{1}{2}$ dwt. fine; it is therefore worth 4*s.* 4*d.* sterling; but the patacon of account is worth only 4*s.* 2 $\frac{1}{2}$ *d.*; the escalin weighs 75 $\frac{1}{2}$ English grains, and is 7 oz. 5 dwt. fine. A deterioration of the coins took place about the year 1792, as the patacon then coined is found to weigh only 423 grains, and to be 10 oz. 5 dwt. fine, which reduces its value to 4*s.* 3*d.*: since that period there has been no coinage at Liege, the city and its territory having been shortly after united to France, and the new French monies and coins introduced there.

The old patagon of Liege is 14 dwt.; worse than English standard; in weight 17 dwt. 20 $\frac{3}{4}$ gr.; and in value 4*s.* 4*d.* sterling. The patagon of 1792 is 17 dwt.; worse than the English standard; in weight 17 dwt. 15 gr.; in content of pure silver 362.3; and in value 4*s.* 2 $\frac{1}{2}$ *d.* sterling.

The impression on the patagon of Basil is a view of the city, over which is the name BASILEA; reverse, a griffin supporting the arms of the city; legend, DOMINE CONSERVA NOS IN PACE. But the new ecus of 1795, &c. bear the arms of the city, with a hat and feathers, and the legend, RESPUBLICA BASILEENSIS; and on the reverse, a wreath of oak, inclosing the legend as on the ducat. The impression on the patagon of Bern is a man resting on his sword, legend, DEUS PROVIDEBIT; reverse, arms of the city; legend, RESPUBLICA BERNENSIS. The old patagon or ecu of Geneva, has upon it a two-headed eagle crowned; legend, POST TENEBRAS LUX; reverse, arms of Geneva, and over them a sun, with the letters I. H. S. in the centre; legend, RESPUBLICA GENEVENSIS. The ecu of 1794 bears the head of a woman with a mural crown, legend, REPUBLIQUE GENEVOISE, and under it EGALITÉ, LIBERTÉ, INDEPENDENCE; reverse, two ears of corn, and between them the words PRIX DU TRAVAIL, L'AN III. DE L'EGALITÉ; legend, APRES LES TENEBRES LA LUMIERE. But the ecus coined since that period have a sun with the letters I. H. S. in the centre; the legend, POST TENEBRAS LUX, with XII FLORINS, IX SOLS; reverse, the arms of Geneva encircled by a wreath of oak; legend, GENEVE REPUBLIQUE, L'AN V. DE L'EGALITÉ. The half ecu bears the same impressions, except that it is marked within the sun VI FLORIN, IV S. VI D.

PATADA, in *Geography*, a town of Hindooſtan, in the circar of Aurungabad; 30 miles N. of Darore.

PATÆCI, or **PATAICI**, in *Mythology*, images of certain gods carried by the Phœnicians on the prows, or, as others say, on the stems, of their gallees.

Herodotus, lib. iv. calls them παταίκιοι. The word is Phœnician, and derived from *patibica*, *i. e.* *titulus*. (See Bochart's Chanaan, lib. ii. cap. 3.) But Scaliger does not agree. He derives the name from the Hebrew word *patach*, inſculpere, to engrave; and Bochart from *batach*, confidere, to trust in; neither of which etymologies agrees to the use which the Phœnicians, and after them the Greeks, made of the gods pataici. Morin derives it from πατακός, *monkey*, this animal having been an object of worship among the Egyptians, and hence might have been honoured by their neighbours.

Mr. Elfner has observed, that Herodotus does not call the *pataci* gods; but that they obtained this dignity from the liberality of Hesychius and Suidas, and other ancient lexicographers, who placed them at the sterns of ships, whereas Herodotus placed them at the prow. This ancient historian intimates that they resembled little pigmies, and that they were so ugly that they provoked the scorn of Cambyses, when he entered into the temple of Vulcan in Egypt.

Seager, Bochart, and Selden, have taken some pains about this subject.

Mr. Morin has also given us a learned dissertation on this head, in the *Memoires de l'Acad. des Inscrip. & Belles Lettres*, tom. i. but Mr. Elfner thinks it defective in point of evidence.

PATAGOA, in *Geography*, a river of Brasil, which runs into the sea near Rio Janeiro.

PATAGONIA, or as it is called by some geographers, "The Magellanic Lands," and by others "Tehuelia," a country of South America, bounded on the N. by the viceroyalty of La Plata or Buenos Ayres, on the E. by the Atlantic ocean, on the S. by the straits of Magellan or Magellaens, and on the W. by the South Pacific ocean; extending from about $64^{\circ} 30'$ to $74^{\circ} 30'$ W. long., and from about 38° to 54° S. lat. The boundaries of this country, however, are not accurately ascertained, and its figure is very irregular. This country was first discovered by Magellan in the year 1519 (see *Straits of MAGELLAN*); but his account of it is defective and erroneous. The inhabitants have been represented by Dr. Robertson, as occupying that vast, but least known, region of America, which extends from the river De la Plata to the straits of Magellan. Their proper station, however, is in that part of the interior country which lies on the banks of the river Negro; but in the hunting season, they often rove as far as the straits already mentioned, which separate Terra del Fuego from the main land. The first accounts of this people were brought to Europe by the companions of Magellan, who described them as a gigantic race, above eight feet high, and strong in proportion to their enormous size. Several navigators have, in the course of the last century, visited the country of the Patagonians; but, like their predecessors, they differ in their account of its inhabitants. Commodore Byron and his men, who entered the straits in 1764, represent them to be of a gigantic stature, and to realize the tales of monsters in a human shape. One of them, who appeared to be a chief, had the skin of some wild beast thrown over his shoulders, and was painted so as to exhibit a hideous appearance: round one eye was a large circle of white, a circle of black surrounded the other, and the rest of his face was streaked with paint of different colours. Captain Byron did not measure him; but judging of his stature by its proportion to his own, he concluded it could not be much less than seven feet. This was the general size of the men, and the women were proportionably large. They were all painted and clothed nearly in the same manner: their teeth were as white as ivory, remarkably even and well set; but, except the skins, which they wore with the hair inwards, most of them were naked, some few only having upon their legs a kind of boot, with a short pointed stick fastened to each heel, which served as a spur. When they were prevailed upon to sit down, they accepted a quantity of yellow and white beads, which were distributed among them, with pleasure. They did not appear to be wholly strangers to European ornaments; for one woman among them, of an enormous size, and having her face frightfully painted, had bracelets, either of brass, or very pale gold, upon her arms, and some beads

of blue glass strung upon two plaits of her hair. These apparent giants had with them a great number of dogs, with which, it was supposed, they chased the wild animals which served them for food. Their horses, though not large, nor in good condition, seemed to be nimble, and well broken. Their bridle was a leathern thong, with a bit of a small piece of wood, and their saddles resembled the pads used among the country people in England. The women rode astride, and both men and women without stirrups; and yet they galloped without fear over the spit on the shore, the stones of which were large, loose, and slippery. Such is the account given by Byron, in *Hawkeforth's Voyages*, vol. i. Mr. C. Clarke, an officer of Byron's ship, in a letter published in the *Philosophical Transactions*, vol. lvii. describes the Patagonians as of a copper colour, with long black hair, and says, that some of them were certainly nine feet, if they did not exceed this stature. They are stout and well made: the women, he says, were from seven and a half to eight feet, though there was hardly a man less than eight feet. It does not appear, however, that these people were actually measured. The country is represented as somewhat hilly: the soil, in that part which lies off Port Desire, is sandy, producing nothing but a coarse harsh grass. Captain Wallis, who visited this coast in 1766, measured those that appeared to be the tallest among them. One of these was six feet seven inches high, several more were six feet five inches, and six feet six inches; but the stature of most was from five feet ten inches to six feet. Captain Carteret's account agrees with that of captain Wallis. (See *Philosophical Transactions*, vol. lx.) These seem to have been the same people, whose size had been so much over-rated in the year 1764; for several of them had beads, and red baize, such as that which had been put on board captain Wallis's ship, and which he naturally concluded they had got from captain Byron. In 1767 they were again measured by M. Bougainville, whose account agrees nearly with that of captain Wallis. To these testimonies we may here add another of great weight. In the year 1762, Don Bernardo Ibagnez de Echavari accompanied the Marquis de Valdelirios to Buenos Ayres, and resided there several years. He observes, that the southern extremity of America is inhabited, not by the fabulous Patagonians, who have been supposed to occupy this district, but by Indians of the same stature with Spaniards, among whom no one was seen that exceeded in height two varas and two or three inches, *i. e.* about 80 or 81.332 English inches, if Echavari makes his computation according to the vara of Madrid. This agrees nearly with the measurement of captain Wallis. Mr. Falkner, who resided as a missionary forty-eight years in the southern parts of America, says, that "the Patagonians, or Puelches, are a large bodied people; but I never heard of that gigantic race which others have mentioned, though I have seen persons of all the different tribes of Southern Indians." Captain Wallis describes them as being of a deep copper colour, like that of the Indians in North America, with straight hair as harsh as hog's bristles, which was tied back with a cotton string: they are well made, robust, and bony, but their hands and feet are remarkably small. They were clothed with the skins of the guanico, an animal resembling a deer, without horns, and having a hump on its back: these skins were sewed together in pieces about six feet long and five feet wide, wrapped round the body, and fastened with a girdle, with the hairy side inwards: some of them had a square piece of cloth made of the downy hair of the same animal, through which a hole being cut for the head, the rest hung round them about as

low as the knee. They also wore a kind of drawers, and buskins, reaching from the mid-leg to the instep before, and behind brought under the heel: the rest of the foot was without any covering: round their eyes were the circles already mentioned, and they were painted on their arms, and on other parts of the face. The eye-lids of all the young women were painted black. They talked much, but their language, a single word or two excepted, was unintelligible. Every one had a missile weapon, tucked into the girdle. This weapon consisted of two round stones, covered with leather, and weighing about a pound, which were fastened to the ends of a string about eight feet long. This they used as a sling, keeping one end in the hand, and whirling the other round the head, till with the force it had acquired, they discharged it upon the object. In the management of this double-headed shot they are so expert, as to be able to hit a mark not larger than a shilling, with both the stones, at the distance of fifteen yards: it is not, however, their custom to strike either the guanico or ostrich with them, in the chase, but they discharge them so that the cord comes against the legs of the ostrich, or two of the legs of the guanico, and so twisted round them by the force and swing of the balls, that the animal, being unable to run, became an easy prey to the hunter. They eat their flesh raw, and the paunch of the ostrich without any preparation besides turning it inside out and shaking it. Each of these people, both men and women, says captain Wallis, had a horse with a decent saddle, stirrup, and bridle. The men had wooden spurs, except one who had a large pair of such as are worn in Spain, brass stirrups, and a Spanish scymitar, without a scabbard: but notwithstanding these distinctions, he did not appear to have any authority over the rest: the women had no spurs. Their horses, about fourteen hands high, appeared to be of a Spanish breed. Although they had no objection to familiar intercourse, manifested no intention of mischief, and jumped into the English boats with alacrity and joy, and when in them sung several of their country songs; when on board they expressed no curiosity or wonder which the multiplicity of objects around them had a tendency to excite: they partook of the ship's provisions without hesitation or scruple, but they would drink nothing besides water. The animals on board, particularly the hogs and sheep, and the Guinea hens and turkeys, engaged their attention, but they seemed not to desire any thing which they saw except the apparel; and only one of them, who was an old man, asked for that. When the first volley was fired by the marines in their exercise, they were struck with astonishment and terror; the old man, in particular, threw himself down upon the deck, pointed to the muskets, and then striking his breast with his hand, lay some time motionless, with his eyes shut; thus, as it was supposed, intending to shew that he was not unacquainted with fire-arms, and their fatal effect. The rest seeing the people on board merry, and finding themselves unhurt, soon resumed their cheerfulness and good humour, and heard a second and a third volley fired without much emotion: but the old man continued prostrate upon the deck for some time, and never recovered his spirits till the fire was over. Although they were pleased with the beads and other trinkets which were distributed among them, and seemed very desirous of hatchets and bill-hooks, they did not give the least intimation that they would part with any provisions; therefore no traffic was carried on between them and the English navigators.

This country consists, for the greatest part of it, of open deserts and savannas, with a few willow trees on the rivers; and seems to enjoy a temperate but rather cool climate.

But separated in the middle by the vast mountains of the Andes, one part of it, and also its inhabitants, differ widely from the other. To the northward of La Plata this part of South America is covered with wood and stored with an inexhaustible fund of large timber: but to the southward of that river the eye can scarcely discover a single tree or shrub fit for any mechanical purpose; but even this seemingly barren country has some good pastures, and numerous droves of wild horned cattle, and every district abounds with horses, which are supposed to have been brought hither by the Spaniards.

It has been suggested, that the Patagonians, called also Tehuels, are descendants of the natives of the Canaries, who were a tall people; and it is said that they bury their dead on the eastern shores, as looking towards the country of their ancestors. Bougainville suggests, that they lead the life of Tartars. They are said to ramble through the immense plains of South America, being constantly on horseback, pursuing the game or wild beasts with which these plains abound, and dressing or covering themselves with skins. They also resemble the Tartars in another respect, by pillaging the caravans and travellers.

In a country which lies E. of Bootan, it is said there are men of gigantic stature, being not less than eight feet high. See Turner's Tibet, p. 156.

PATAGONULA, in *Botany*, altered by Linnæus from the original name **PATAGONICA**, bestowed on it by Dillenius, in his *Hortus Elthamensis*, v. 2. 304. t. 226. f. 293. —It was so called from being a native of Patagonia. Such generic names however as are taken from countries being very unexceptionable, it is fortunate that the present one has been abolished, the plant belonging to another genus. See **CORDIA**.

PATAIA, or **PATHAY**, in *Geography*, a town of Hungary; 7 miles N. of Colocza.

PATAK, a town of Hungary, on the Latorcza, in which the Protestants have a college; 25 miles S.S.E. of Caschan.

PATALA, a town of Sweden, in Tavastland; 45 miles N.N.E. of Jamso.

PATALA, one of the receptacles for sinners, or hells of the Hindoos; for a list of which, see **NARAKA**. The name *patala* does not, however, occur there. It means rather the lower regions, a sort of purgatory perhaps, over which Yama presides, who is, however, usually styled king of hell. (See **YAMA**.) It is this word, probably, that some European writers have altered to *Padalon*. As consort to Yama, who is a form of Siva, Parvati assumes the name of *Patala-devi*; which see.

PATALA-DEVI, in *Mythology*, a name of the Hindoo goddess Parvati, in her character of consort of Yama, regent of the lower, or infernal regions. In this character she corresponds with Proserpine, or Hecate, and, like the Grecian goddess, has a triple character; and is sometimes called *Tri-fakti-devi*, and *Tri-fakti-devi-kumari*, meaning the goddess with three powers, and the thrice-potent-virgin-goddess. Thus the triple-virgin-goddess Diana is so named as a terrestrial deity, and Parvati is similarly named *Bhu-devi*, goddess of the earth. Luna and *Svardevi* are severally the celestial goddesses, and *Patala-devi* corresponds with Proserpine, in their subterranean, or infernal designations. See farther hereon under the articles **PARVATI** and **YAMA**.

PATANAM, in *Geography*, a town of Hindoostan, in Marawar; 40 miles N.W. of Ramanadporum.

PATANI, the capital of a kingdom of the same name, in the peninsula of Malacca; 250 miles N. of Malacca. N. lat. 6° 58'. E. long. 103° 40'. See **MALACCA**.

PATAN-

PATANJALI, in *Philosophy*, one of the systems or schools among the Hindoos. It corresponds, in many points, with that of the stoics, and its promulgator Patanjala, with Zeno; but the commentators on the Hindoo systems have buried the succinct works of the founders in such a mass of illustration, as they term it, that their precise differences are not easily determinable. The system called Sankya is two-fold; one division was promulgated by Kapila, of which some notice is taken under that article, and the other by Patanjala. See *PHILOSOPHY of the Hindoos*, and SANKYA.

PATAPA, in *Geography*, a town on the N. coast of the island of Samar. N. lat. $12^{\circ} 40'$. E. long. $125^{\circ} 14'$.

PATAPSCO, a river of America, in Maryland, which rises in York county, Pennsylvania, and pursuing a S. and S.E. course till it reaches Elkridge Landing, about eight miles S.W. of Baltimore, turns eastwardly over falls, and widens into a broad bay-like stream to its mouth, formed in Chesapeake bay by N. point, and Bodkin point on the S., the last being in N. lat. $39^{\circ} 8' 30''$. It is about 30 or 40 yards wide just before it communicates with the basin, on which stands the large commercial town of Baltimore. By its first discoverer it was called Bolus river, from the red earth found near it, resembling bole armeniac. It is navigable for vessels drawing 18 feet water to Fell's point at Baltimore; but its navigation further is prevented by the falls a little above Elkridge Landing.

PATARD, or PATAC, in *Commerce*, a copper coin in Flanders. Patacs are florins or gilders of 20 stuyvers or stivers, each of which was formerly subdivided into 16 pennings, but for a long time they have been divided into 12 parts or deniers. Accounts were formerly kept at Dunkirk, as at Antwerp, in florins, patards, and pennings. The following proportions subsisted among the old monies of Dunkirk; 17. Flemish = 6 florins = $7\frac{1}{2}$ livres Tournois = 20 shillings = 120 patards = 150 sous = 240 pence or gros = 1800 deniers = 1920 pennings. But of late years the new French system of francs and centimes has been adopted, and the new coins of France are also used at Dunkirk. At Lisle, a patard, or stiver, is reckoned at $1\frac{1}{4}$ sou, or 15 deniers; however, the present current coins are chiefly those of France.

PATARINS. See ALBIGENSES and PAULICIANS.

PATARNE, in *Geography*, a town of France, in the department of the Sarthe, and chief place of a canton, in the district of Mamers. The place contains 717, and the canton 9941 inhabitants, on a territory of 175 kilometres, in 17 communes.

PATASPOUR, a town of Bengal; 28 miles S.S.E. of Midnapour. N. lat. $22^{\circ} 3'$. E. long. $87^{\circ} 37'$.

PATATE, a town or village of South America, in the audience of Quito, and jurisdiction of the assiento of Hambergs, situated between Riobamba and Latacunga. Patate is famous for its plenty of sugar-canes, and the fineness of its sugar.

PATAVINITY, PATAVINITAS, among *Critics*, a fault objected to Titus Livy, which he derived from his country Padua, by the ancients called Patavium.

Afinius Pollio, as we are informed by Quintilian, taxed Livy with Patavinity. But what this Patavinity consisted in, the critics have been much puzzled to find out.

Morhof believes it to be a certain turn of expression, and some phrases peculiar to the Paduese. All we know for certain is, that it was a fault in the language of Livy, not in the sentiments or manners. In all probability it is one of those delicacies that are lost in a dead language.

Dan. Georg. Morhof has an express treatise, "De Pata-

vinitate Liviana," printed at Kiel in 1685, where he explains, very learnedly, the urbanity and peregrinity of the Latin tongue.

PATAVIRCA, in *Geography*, a town of Peru, in the jurisdiction of Santa, or Guarmey, consisting of about 60 houses; and lying upon the road from Paita to Lima, 67 miles N. of that city. In its vicinity, at the distance of about three quarters of a league, and near the sea-coast, are the ruins of a palace of the Indian princes. S. lat. $10^{\circ} 25'$.

PATAVIUM, in *Ancient Geography*, a town of Italy, in Venetia. The honour of its foundation is ascribed to Antenor. It was situated in a country so fertile, that Constantine Palæologus is said to have declared, that throughout the East, he did not know a place so proper for the seat of the terrestrial paradise. Its citizens were distinguished at Rome more than those of other towns, as they had a right of suffrage in common with the Roman citizens themselves. It was taken and destroyed by Attila, about the year 450 or 452, and soon after re-established by Narsetz. It was taken by the Lombards in 601, and reduced to ashes; but Charlemagne restored its former lustre. See PADUA.

We learn from Tacitus (*Annal.* l. xvi. c. 21.) that this city was accustomed to celebrate the antiquity of its origin, and the name of its founder, in annual games, said to have been instituted by that hero. Livy informs us (l. x. c. 2.) that a Naumachia, exhibited annually on one of the rivers that water the town, perpetuated the memory of a signal victory obtained by the Paduans, long before their union with Rome, over a Lacedæmonian fleet, commanded by Cleonymas. They are also said to have not infrequently assisted the Romans, and contributed in no small degree to their victories, particularly over the Gauls, the common enemy of both states, while an immense population furnished them with the means of giving effect to their measures, by sending powerful armies into the field. Padua afterwards submitted to the genius of Rome, but submitted with dignity, and was accordingly treated not as a conquered, but an allied republic. She was admitted to a participation not only of the franchise, but even of the riches of Rome, as she could count at one period 500 Roman knights among her citizens, and drew by her manufactures, from the emporium of the world, no small share of the tribute of the provinces. After having shared the glory of Rome, Padua partook of her disasters; like her she was plundered by Alaric and Attila; and, like her, half depopulated by the flight of her dismayed inhabitants, and obliged to bend under the yoke of a succession of barbarian invaders. Padua was, after the expulsion of the Goths, subjected to the Lombards, the Franks, and the Germans. At length it shook off the yoke, and with its sister states, Verona, Vicenza, Ferrara, and Mantua, experienced the advantages and disadvantages of republicanism, occasionally blessed with the enjoyment of freedom, and occasionally, with all its forms, smarting under the rod of a powerful usurper. At length, in the 15th century, Padua united itself to the Venetian territory, and under the influence of its laws acknowledged the supreme authority of that republic. At a late period it suffered much by fire and sword, as well as by earthquakes and pestilence. Nevertheless, it is still a great, and in many respects a beautiful city, as its circumference is near seven miles, its population about 40,000 persons, and notwithstanding the general narrowness of its streets, many of its buildings, public and private, are truly magnificent. The abbey of St. Giustina deserves particular attention; it was planned by Palladio, and built by Andrea Riccio in the highest style of architecture. The piazza before it, called Prato della Valle, is perhaps one of the largest and noblest in Europe. The cathedral deserves

deserves to be ranked in the class of eminent buildings; and the church, called "Il Santo," from St. Antony of Padua, is of Gothic architecture, and was enriched, before the late French invasion, with a valuable treasury; the tomb of the saint, however, still remains, adorned with fine marble, and most exquisite sculpture. The town-hall, "Il Salone," is remarkable for its magnitude, being 312 feet long, 108 broad, and 108 high, and contains a monument in honour of Livy, with an ancient bust. In ancient times, Padua was famous for its woollen manufactures, celebrated in prose by Strabo, and in verse by Martial; it still retains much of its reputation in this respect, its wool, and woollen articles, being considered as the best in Italy. But the principal glory of Padua arises from its literary pursuits, and an ancient, and well directed propensity to literary science. The university was founded about the 11th century, and its foundation was to Padua the commencement of an era of glory and prosperity. Students, amounting in number to 18,000, are said to have crowded its schools during ages. Of 18,000 students, 600 only remain; though the lecturers are men of zeal and abilities, the plan of studies, the result of long and successful experience, and its libraries, collections and cabinets of every kind numerous and magnificent. Its decline is owing to the establishment of similar institutions in other countries, and to the general diffusion of the means of knowledge. Besides the university, in which is an agricultural lecture, encouraged by the allotment of 15 acres of land for experiments, Padua has several academies, which have been established at different times, and are supported with spirit. Eustace's Classical Tour through Italy, vol. i.

PATAY, in *Geography*, a town of France, in the department of the Loiret, and chief place of a canton, in the district of Orleans; 12 miles N.N.W. of Orleans. The town contains 930, and the canton 6198 inhabitants, on a territory of 227½ kilometres, in 15 communes. This place is famous for the defeat of the English by the French, under the conduct of the celebrated Maid of Orleans, in the year 1429.

PATAZ. See CAXAMARQUILLA.

PATCHEPALIAM, a town of Hindoostan, in Coimbatore; 13 miles N.N.E. of Coimbatore.

PATCHIEU, a river of Bootan, called by the Bootans Jumba Chieu, or the junction of three rivers, viz. the Hatchieu, the Tchintchieu, and the Patchieu.

PATCHWARY, a town of Bengal; 32 miles S. of Rajamal.

PATCOOM, a town of Bengal; 50 miles S.W. of Rongonapour. N. lat. 23° 3'. E. long. 87 2'.

PATE, in *Fortification*, a kind of platform, like what they call a horse-shoe; not always regular, but generally oval, encompassed only with a parapet, and having nothing to flank it. It is usually erected in marshy grounds, to cover a gate of a town, or the like.

PATE, in *Geography*, a small island of France, in the river Gironde, near Baye.

PATEABARRY, a town of Bengal; 20 miles S. of Moorshedabad.

PATEAGUR, a town of Hindoostan, in the circar of Sollepour; 35 miles N.W. of Sollepour.

PATEE, or PATTEE, a term, in *Heraldry*, for a cross, small in the centre, and widening towards the extremes. The field, sable, a cross patee, argent; by the name of Cross.

This form of a cross is also called *formé*.

It is also a term used by some to express a sort of irregular line, differing from the indented, ingrailed, and all the other regular and common lines, and called by some the dove-tail line.

It is somewhat like the joint called by our joiners by this last name, but it is not in general use, and is by some reckoned among what the French call the *clatte*.

PATEEBA, in *Geography*, a town of Hindoostan, in Benares; eight miles S. of Chunar.

PATEES, PATTY. See PETTY.

PATEGOW, in *Geography*, a town of Hindoostan, in the circar of Hindia; eight miles S. of Hurdah.

PATEL, in *Biography*, a French landscape painter much esteemed. The place of his birth, and the date of it, are equally unknown. The execution of his pictures is of an easy, light, and agreeable character; and his general taste of a pleasing nature; but he does not rank above the class of artists merely agreeable.

PATELI, or PUTALA, in *Geography*, a town of Thibet, in the district of Lassa, where is situated, upon a mountain, the temple or palace of the grand Lama; five miles E. of Lassa.

PATELLA, in *Anatomy*, the knee-pan, a small bone situated in the tendon of the extensor muscles of the knee, and occupying the front of the joint. See EXTREMITIES.

PATELLA, *Fractures of*. See FRACTURE.

PATELLA, *Dislocations of*. See LUXATION.

PATELLA, the *Limpet*, in *Natural History*, a genus of worms of the class and order Vermes Testacea, of which there are about 250 species described. The animal is a limax: the shell is univalve, subconic, shaped like a basin, and without a spire. In all cases the shells of this species are attached to some hard body. Their summit is sometimes acute, sometimes obtuse, flattened, turned back or perforated. The rock, or other hard body to which they are always found adhering, serves as a kind of second or under shell to preserve them from injury; hence they have by some naturalists, though erroneously, been classed among the bivalves. The shells have been analysed, and they are found to consist chiefly of carbonate of lime. When exposed to a red heat, they emit a smell like horn; and when dissolved in acids, a semi-liquid gelatinous matter was left behind. The various species, which are so numerous, are distinguished by the peculiarities in their shells. The species are separated into five sections.

Species.

Section A. *Furnished with an internal lip; shell entire.*

EQUESTRIIS. Shell orbicular, perfoliate outwardly; lip vaulted perpendicular. This species, of which there is a variety, inhabits the Indian and American seas. It is an inch wide.

NERITOIDEA. Shell ovate, with a subspiral tip; lip lateral. The native place of this species is not known. It is generally found adhering to other testaceous substances. The shell is the size of a cherry, and the inhabitant is red.

SINENSIS. Shell subconic, smooth; lip somewhat lateral. It inhabits the Mediterranean, Atlantic, and Indian seas. The shell is very thin and pellucid, sometimes it is of a chestnut colour speckled with minute grey dots, but generally it is white, with brown spots and rays.

PORCELLANA. Shell oval, with a recurved tip; lip placed behind, and flat. It inhabits India and Goree. The shell is convex, within white, the outside red, with white scaly spots, and transverse undulate blue lines.

FORNICATA. Shell oval, obliquely recurved behind; lip placed behind, and concave. This is found in the Mediterranean and near the island of Barbadoes,

ACULEATA. Shell oval, brown, with prickly striz; the

the crown is recurved. This is found in the American islands.

TROCHIFORMIS. Shell conic, longitudinally plaited; internal lip lateral. It inhabits Tranquebar and the Falkland islands.

AURICULA. Shell roundish, with radiate grooves and striate; crown recurved; internal cavity ear-shaped. It inhabits Borneo, Santa Cruz, and St. Thomas's islands.

RUGOSA. Shell ovate, thin, hyaline, obsolete wrinkled transversely; margin unequal; lip unequally repand, hyaline. It inhabits China, and is generally found in the *Buccinum spiratum*.

GORENSIS. Shell oval, flat, thin, white, glossy, lamellate on the outside. This is found adhering to rocks at Goree, and is about half an inch in diameter.

CONTORTA. Shell granulate with white, with very fine perpendicular oblique ribs; the lip is very thin, oblique and covering half the cavity. This is a very small shell.

EXPLANATA. Shell white, very finely striate; crown inclining downwards, and dilated, behind which the shell is depressed.

PLICATA. Shell conic ochraceous, with ferruginous rays within, with longitudinal transversely striate plaits.

STRIATA. Shell conic, white and striate, with undulate grooves; the crown is a little lateral.

SOLEA. The shell of this is a little twisted, pellucid, with ferruginous spots, thinly plaited, and transversely grooved above; lip undulately repand.

ECHINATA. Shell conic, prickly, glabrous within. It is found fossil near Crignon. The shell is calcareous and whitish, covered on the outside with prickles.

Section B. *With the margin angular or irregularly toothed.*

CREPIDULA. Shell oval, flattish, smooth, the lip flat behind. It is found in the Mediterranean, especially about the coasts of Barbary.

LACINIOSA. Shell with elevated unequal rays, thicker and obtuse on the outside. This is an inhabitant of India.

SACCHARINA. The shell of this species is angular, with seven carinate obtuse ribs. It is found at Java and Barbadoes.

BARBARA. Shell toothed, with nineteen elevated vaulted muricate rays. It is found near the Falkland islands.

GRANULARIS. Shell toothed, with elevated angular imbricate striæ. Inhabits Southern Europe, and the Cape of Good Hope.

GRANATINA. Shell angular, with numerous muricate striæ. It inhabits Jamaica and Southern Europe, is from one to three inches long.

* **VULGATA.** Shell with about fourteen obsolete angles, and dilated acute crenate margin; crown central. This is described and figured in Donovan's Shells: it inhabits the marine rocks of Europe and India. It is about two inches high, and from three to four wide: in the older shells the margin is nearly even, and the number of ribs irregular.

* **DEPRESSA.** Shell with fourteen angles, oblong; crown lateral. This is described and figured in Pennant's British Zoology. It inhabits the rocks of Europe.

CERULEA. Shell crenate, subangular, with numerous unequal striæ; beneath it is blue. This is an inhabitant of the Mediterranean.

TUBERCULATA. The shell of this species is slightly toothed, conic, tuberculate, retuse behind. The shell is yellowish, with white tubercles disposed in rows.

LEPAS. Shell roundish, pectinate, with imbricate tuberculate transversely striate rays; crown incurved. There are two varieties, the one found in Cluli, the other in the

Falkland islands. The second is usually named the Bronze limpet.

TRICOSTATA. Shell oval, three-ribbed, white, striate at the sides; internal margin flattish and a little jagged. It is found in the Indian ocean.

MYTILINA. Shell carinate, rounded on the fore-part, with undulate striæ, brown, perlaceous within, the hinder margin crenate. Found in different parts of South America, and is an inch and a quarter long.

OVATA. Shell toothed, oval, rather conical, ribbed, white, brown between the ribs, within brown with white grooves.

STELLATA. Shell angular, ovate, depressed, with ten elevated rays, and shorter intermediate ribs.

ISLANDICA. Shell solid, ovate, gibbous, unequally ribbed, within glabrous, with alternate cinereous and horny rays; margin crenate. It inhabits, as its specific name denotes, the shores of Iceland, and is about an inch and a half long.

CYPRIA. Shell oval, subpellucid, ribbed, the ribs are occasionally tuberculate, and foliaceous on the outside. It inhabits the shores of Cyprus.

COSTATA. Shell ovate, a little gibbous, white, with crowded unequal tuberculate rugged ribs.

LEUCOPLEURA. Shell ovate, dusky, with crowded white smooth unequal ribs.

STRIATULA. The shell of this species is a little rugged, white, with brown flexuous striæ branching outwards, with two brown spots in the bottom of the hollow.

OCTORADIATA. Shell convex, with eight larger tuberculate ribs besides lesser ones. It inhabits the American islands.

RUBRA. Shell toothed, red under the brown skin, with elevated rounded striæ, and lesser imbricate ones, within white.

HEPATICÆ. Shell ovate, gibbous, thin, toothed, and of a liver colour, with elevated carinate, obtusely spined striæ.

BADIA. Shell subconvex, brown, within bay, with twelve larger rays each surrounded by a rib, and as many lesser ones.

FUSCESCENS. Shell flattish and brown, with ten elevated striæ; crown of a different colour; bottom with a pale liver coloured spot, edged with glaucous and gold; the inner margin in brown. The shell is from two to four inches long; more or less convex.

MACULOSA. Shell flattened, the fore part narrow and rounded; yellowish, spotted with brown, with a white crown; with flat rounded equal rays.

ROTUNDATA. Shell suboval, flattened, varied with brown, with rounded flat ribs and a differently coloured crown and bottom.

PECTEN. Shell ovate, obscurely edged with white, radiate, with distant striæ pectinate outwardly; crown grey; bottom with a spot surrounded with a white belt. It is found in North America.

CORRUGATA. Shell ovate, wrinkled, chestnut; crown with a white circle; within cinereous, radiate with white; bottom pale edged brown edged with white.

ALBORADIATA. Shell ovate, each side brown, radiate with white, with elevated pectinate striæ; the crown is white and the bottom yellowish. It is about half an inch long.

OLIVACEA. Shell ovate and olive colour; within brown, varied with white, with elevated unequal striæ; the margin with two rows of unequal spines; crown pale yellow; bottom silvery, with a brown centre. The shell is half an

PATELLA.

inch long, and the bottom is surrounded with a white belt.

CEREA. Shell ovate, both sides waxen colour, perpendicularly striate, with thirteen flattened ribs and white bottom.

IMPRESSA. Shell ovate, with elevated, transversely striate, brownish striæ, spotted with white, and reaching half way down; crown with a white impressed circumference.

AURANTIA. Shell ovate, solid; citron undulate with brown, with elevated crowded wrinkled striæ and white bottom.

CINGULUM. Shell ovate, denticulate, cinereous, with three black belts, within milk-white, with elevated unequal striæ, nodulous on the outside, and spinous at the margin.

OCULATA. Shell ovate, white, with flattened ribs of unequal length, brownish between them; crown with a brown belt.

MAGELLANICA. Shell thin, ovate, white, with a nodulous margin, within perlaceous, with elevated striæ; crown pointed, brown; bottom brown. It inhabits the straits of Magellan.

OCHROLEUCA. Shell ochraceous, with three yellow bands, and elevated, acute, unequal striæ; crown white; bottom silvery.

DENTATA. Shell white, denticulate, with elevated, acute, unequal striæ; crown surrounded with a double row of cinereous dots, and a dusky-grey band.

NODOSA. Shell yellow, radiate with brown, with elevated, nodulous, unequal striæ; crown and bottom white.

CINEREA. Shell toothed, cinereous, with unequal elevated striæ, between which it is brown and rugged; crown pointed, milk-white.

EXALBIDA. Shell whitish, with brown rays, and elevated, rounded, unequal striæ, between which it is rugged; crown obtuse, white, with a broad interrupted brown band, and another marginal one.

CANCELLATA. Shell cinereous and brown, with decussate striæ and two rows of tubercles; the crown is yellowish, and the bottom has a white spot. There is a variety that is grey, with dusky rays, and a few yellow striæ; within dirty yellow with a white bottom. It is found in Jamaica, and is about one inch and a half long.

LÆVIS. Shell rounded, smooth, yellowish, with a broad citron marginal band spotted with brown, and another narrow one; margin dilated, acute, and a little rugged.

ARGENTEA. Shell smooth, thick, a little silvery; with eleven brown rays; margin silvery; crown pale yellow; bottom ivory, with a double white ring. This is about two inches long, but is very rare.

CUPREA. Shell white, with strong, rounded, brown ribs, within perlaceous; crown and bottom coppery.

RUBIDA. Shell pale, liver-coloured both sides, with alternate larger and lesser carinate ribs; it has a flat and white crown.

GLABRA. Shell brown, glabrous above, with elevated crowded white striæ beneath; crown obtuse, white, with a fulvous border; bottom fulvous.

FLAVEOLA. Shell yellowish, varied with brown; with flattened unequal ribs; crown obtuse; bottom varied reddish and white.

INFUNDIBULUM. Shell denticulate, compressed on each side, rounded, yellow, with perpendicular striæ and carinate ribs; bottom varied with white and cinereous.

CYATHUS. Shell rounded, glabrous, white.

SINICA. Shell ovate, entirely yellow, with undulate grooves, within striate perpendicularly; margin scalloped.

It is found in China, and is about three inches and a half long.

PUNCTATA. Shell roundish, white, with many-coloured dots, radiate at the base, and surrounded with two brown rings; margin a little flexuous.

LUGUBRIS. Shell ovate, with annular striæ, black, with elevated unequal striæ; margin crenate; crown and bottom white.

ULYSSIPONENSIS. Shell ovate, toothed, yellowish, with elevated flattened striæ; crown pointed, and of an orange colour.

UMBELLA. Shell oblong, red, with elevated, unequal, white striæ; the margin is crenate. It inhabits Africa, in numerous varieties. The shell is rarely of a straw-colour; it is sometimes spotted or clouded.

CRENATA. Shell thin, pellucid, striate, blackish, with olive rays, within glaucous or cinereous; crown pointed; margin crenate; bottom milk-white. It is found on the shores of Africa, Malaga, and Lisbon.

FERRUGINEA. Shell ferruginous, with angular or undulate ruffet lines, and cinereous belts, within milk-white, with elevated knotty striæ; the margin is plaited.

MELANOGRAMMA. Shell oval, ochraceous, with elevated black striæ, within silvery, spotted; crown pointed, white; bottom with a straw-colour spot.

REPANDA. Shell ovate, thin, within silvery, with brownish rays, and thin undulate striæ, with bay-coloured granulations. The margin is flexuous. It inhabits the seas of Magellan.

ANGULOSA. Shell oval, white, with very thin striæ, and varied with red spots and dots; margin eight-angled.

TIGRINA. Shell oval, smooth, polished; pellucid, striate with seven yellowish ribs; the colour is blueish-olive, dotted with brown; the margin is seven-angled.

MONOPIS. Shell oblong, flattish, bay striate with white, within milk-white, with eleven elevated unequal striæ; crown rounded, white. It inhabits the American islands.

CHLOROLICTA. Shell ovate, toothed, brown, dotted with green, with eleven elevated, hollow, broader striæ, and as many narrower ones; the crown is white.

MARGARITACEA. Shell thin, unequally striate, white, within perlaceous; crown with an orange mark, surrounded with a yellowish ring; the margin crenate. This is an Iceland shell.

TENUSSIMA. Shell oval, thin, ochraceous, with angular chestnut lines, and elevated, obtuse, hollow, unequal striæ.

MITRULA. Shell solid, sub-conic, transversely plaited, with a flexuous margin. It inhabits Barbadoes.

PLICARIA. Shell ovate, toothed, with thirty elevated, obtuse, undulate, and transversely wrinkled striæ. Found in the straits of Magellan.

PENTAGONA. Shell whitish, obtusely pentangular, with a dilated crenate margin; crown obtuse; bottom reddish.

ÆNEA. Shell ovate, tender, pellucid, with elevated striæ, covered with a whitish cuticle, under which it is silvery, with ruffet rays; crown and bottom coppery. It inhabits the straits of Magellan.

CONCHACEA. Shell thin, oblong-ovate, with very fine undulate striæ, yellowish, with elevated darker rays; crown recurved. It inhabits South America, and resembles the common muscle, except in the hinge.

STANNEA. Shell ovate, silvery, with elevated flattened striæ; crown obtuse, coppery; bottom with an oval bay mark; the margin is flexuous.

CANDIDISSIMA. Shell orbicular, striate, white, with a brownish band, dotted with brown, within grey, with unequal striæ; margin transversely wrinkled.

PATELLA.

Section C. *With a pointed recurved tip or crown.*

* **HUNGARICA.** Shell entire, conic, striate, with a hooked revolute crown. This is described and figured in Donovan's British Shells; and likewise in Pennant's British Zoology, vol. iv. It inhabits the American, Mediterranean, and Asiatic seas.

IMBRICATA. Shell entire, oblong, imbricate, the crown placed behind.

* **MAMMILLARIS.** Shell entire, conic, striate, sub-dia-phanous, with a reflected smooth crown. This is described and figured by Pennant, and it inhabits the shores of the Mediterranean and Africa.

TRICARINATA. Shell substriate, with three ribs on the fore-part.

PECTINATA. Shell entire, ovate, with wrinkled slightly branched striæ; crown nearly central, reflected, and pointed. It is found on the shores of the Mediterranean, and is about two inches long.

LUTEA. Shell entire, oval, convex, striate, with a sub-marginal, reflected, mucronate crown. It inhabits divers parts of India, and is about the size of a melon seed.

CRISTATA. Crown revolute; back crested, carinate.

* **LACUSTRIS.** Shell very entire, oval, membranous, with a nearly central, mucronate, reflected shell. It inhabits the fresh waters of Europe.

* **FLUVIATILIS.** Shell very entire, oval, a little horny, with a marginal mucronate crown; aperture oval. This is very like the last, and inhabits, like it, the fresh waters of Europe.

CÆCA. Shell entire, with elevated dots, and striate; crown acute, straight. Found in the bays of Norway, on stones. The shell is white, with from sixty to eighty striæ; the inhabitant is white, ovate, without the least appearance of eyes.

VIRGINEA. Shell very entire, white, with red bands. This is found on the fuci, in the bays of Norway.

TESSLATA. Shell, very entire, of a whitish colour, tessellate with red. Found on the rocks and fuci about Norway.

FULVA. Shell very entire, orange, with a mucronate and nearly vertical crown. It inhabits Norway, on fuci and testaceous substances.

SUBSPIRALIS. Shell ovate, with an obtuse sub-spiral tip. Found in Norway.

AMBIGUA. Shell ovate, with a slightly toothed margin, and a rather acute and reflected point. Inhabits Norway.

RUBICUNDA. Shell very entire, rather conical, smooth, and reddish. It inhabits the deeps of Greenland.

BORNIANA. Shell ovate, very entire, with very fine longitudinal striæ, white, with red veins.

CALYPTRA. Shell entire, with imbricate ribs; the crown is hooked; the margin sinuate. Inhabits North America.

MELANOLEUCA. Shell striate, very entire, alternately black and white.

PECTUNCULUS. Shell oblong, convex, with elevated nodulous striæ, slightly toothed, within polished; crown curved forwards.

FASCIATA. Shell ovate, white, with a brown band, and elevated acute striæ; the margin is dilated, crenate, and cinereous within.

ELEGANS. The shell of this species has decussate striæ that are white, radiate with red, denticulate; the crown is grey.

SQUAMOSA. Shell with elevated striæ, transversely undulate on the outside, brown, silvery towards the margin, crown bronzed, hooked.

SQUALIDA. Shell entire, brown, within whitish with a blueish bottom; the margin blueish, radiate with brown, with elevated obsolete striæ; crown knotty.

CROCEA. Shell smooth, sub-angular, yellow, radiate with brown; crown obtuse, white; bottom with a whitish spot.

CANDIDA. Shell ovate, smooth, on both sides white, with a rosy belt on the outside.

TRIGONA. Shell compressed, convex in the middle, cancellate, white, with a brownish band on the outside, and margin within; crown marginal, obtuse.

MINIMA. Shell rounded, convex, thin, smooth, whitish with reddish spots; crown very obtuse, and white. It inhabits Ferroe island.

TRANQUEBARICA. Shell ovate, thin, pellucid, with very fine crowded striæ, chestnut with white scales, within milk-white, with a brown spot at the bottom; the crown is marked with an azure spot. It inhabits Tranquebar, as its name imports.

PERVERSA. Shell oblong, horny, very thin, pellucid, glabrous, with a ferruginous base. It is found in Africa. The point of the crown is bent back towards the hind parts of the snail.

CERNUA. Shell with decussate grooves, thin, pale flesh-colour, with an oblong aperture.

INCURVA. Shell entirely white, flat; point of the crown twisted.

INTERRUPTA. Shell oval, depressed, glabrous, brownish, with green dots disposed in oblique interrupted rays; crown with an obtuse hook.

Section D. *Very entire, and not pointed at the tip or crown.*

AFRA. Shell conic, striate, greenish or pale brown, within white; crown glabrous, white, obtuse, central; margin glabrous. It inhabits the island Gorée.

LUSITANICA. Shell conic, white, with brown rays marked with striæ, granulate with black; crown acute, not radiate, and surrounded with a chestnut ring. It inhabits Portugal, on the sea rock, and is very small.

RADIATA. Shell rounded, convex, grey, with decussate striæ; crown pointed, central, and marked with twelve orange radiate lines; the bottom is horny. It inhabits Jamaica.

ARÉOLATA. Shell pyramidal, reddish-grey, with very thin circular striæ, crossed by longitudinal ones; crowned violet. It resembles the *P. magellanica* of a former section, but is more depressed, and broader at the base.

FLAMMEA. Shell ovate, with very fine annulate striæ, reddish-grey, with undulate brown rays; the crown is acute, central, white in the middle.

INDICA. Shell reddish-grey, with radiate striæ, glabrous, narrower on one side; crown acute, smooth, surrounded with a reddish ring. It inhabits India, is nearly four inches long, and resembles the *P. rustica*, to be described hereafter.

SURINAMENSIS. Shell thick, subovate, yellowish, with black rays, and longitudinal unequal striæ, and surrounded with knotty belts; crown obtuse, smooth and white. It inhabits Surinam.

VITELLINA. Shell ovate, yellow, with an unequally striate base, and obtuse whitish crown.

SANGUIOLENTA. Shell ovate, convex, white, solid, with intermixed, capillary, and flexuous elevated longitudinal striæ; the crown is surrounded with a broad ring, dotted with red. It is found in Africa.

LÆVIGATA. Shell ovate, yellow, within blueish-white, with oblique striæ, the crown is white, smooth, and polished.

PATELLA.

PUNCTULATA. Shell rounded, white, with many-coloured dots, radiate towards the base, and surrounded with two brown rings.

* **PELLUCIDA.** Shell very entire, ovate, gibbous, pellucid, with four blue rays. This is described and figured by Donovan, Pennant, Lister, and others. It is about the size of a walnut, and is found in the European and Northern seas.

TESTUDINARIA. Shell very entire, acute, smooth, glabrous. It inhabits the Indian and Northern seas in numerous varieties.

TESTUDINALIS. Shell very entire, ovate, and striate; a variety has its crown obtuse, and nearly central. It inhabits the seas about Greenland, among fuci.

COMPRESSA. Shell very entire, oval, oblong, striate, smooth, compressed on the back. It inhabits India, and is about four inches long.

RUSTICA. Shell very entire, conic, with fifty obtuse striæ.

FESCA. Shell very entire, ovate, obtuse, with elevated striæ.

NOTATA. Shell entire, striate, with a sub-mucronate erect crown, within white, with a black heart-shaped spot white in the middle. It inhabits the Mediterranean.

CRUCIATA. Shell very entire, oval, sub-convex, brown, with a white cross.

RADIANS. Shell entire, oval, pellucid, depressed, striate, horny, radiate, with black spots. It inhabits New Zealand.

ROTA. Shell roundish, the inside somewhat silvery, the outside with reddish streaks and a yellowish border. It inhabits the Indian and American seas.

UMBELLATA. Shell entire, roundish, diaphanous, depressed, with yellowish rays within; crown pale yellow, margin very acute. It is about four inches and a half long, and is found in the Indian ocean.

PASTULATA. Shell thin, oval, depressed, radiate, white, dotted with red, within smooth.

SYMMETRICA. Shell ovate, conical, solid, brown, divided into partitions by perpendicular white lines, within smooth, white; margin cut archwise.

CITRINA. Shell ovate, convex, with very fine decussate striæ, white, with two broad yellow bands, within whitish, with a milk-white bottom; crown brownish.

CAPENSIS. Shell oval, with decussate striæ, the longitudinal ones alternately brown and white, within somewhat perlaceous, with a white bottom. It inhabits the Cape of Good Hope.

ANOMALA. Shell coarse, brown, orbicular, with a sub-marginal crown. It inhabits the deeps of the Norway seas, on rocks and dead testaceous substances. The shell of this species is very minute, rough, with very fine raised dots, sometimes cinereous, beneath blue; the inhabitant consists of two reddish tough twisted masses, fringed down the whole length; the fringes composed of crowded yellow rigid crisp hairs united to the rest of the body by a blue tendon; ovaries branched, orange; eggs globular.

GUTTATA. Shell finely striate, and varied with dots of different colours; the bottom is dusky. It is about an inch and a half long, and resembles the compressa.

MYTILIFORMIS. Shell glabrous, lead colour, with a white horse-shoe shaped band within. It inhabits the Ferroc island, adhering to zoophytes.

SCUTIFORMIS. Shell oval, thin, black, with white perpendicular flattened striæ.

COCHLEAR. Shell white, flattish, one part narrow, caniculate within, with a blueish callus shaped like a horse-shoe, the other part rounded.

CRATICULATA. Shell oval, thin, depressed, cancellate, radiate.

CRUENTATA. Shell oval, a little convex, varied with red, and slightly toothed, with elevated unequal rough striæ.

PAPYRACEA. Shell depressed, thin, hyaline, dotted with red, with chestnut rays outwardly, and crowded thinner, and granulate thicker striæ.

CYLINDRICA. Shell oval, flat, with crowded longitudinal striæ of unequal thickness, and all granulate.

DECUSSATA. Shell somewhat convex, white, with crowded red dots, within radiate with red and white, with decussate glabrous striæ, and a few longitudinal thicker white ones.

HÆMATOSTRICTA. Shell thin, depressed, white, dotted with red, within brownish, spotted, striate; crown varied with cinereous and brownish.

ASTEROIDES. Shell flattish, cancellate, cinereous, with a chestnut star and rays towards the margin; crown smooth, grey, surrounded with brown dots.

OVALIS. Shell oval, somewhat convex, thin, with crowded striæ, grey, with blackish rays and spots.

RUBELLA. Shell a little convex, striate, reddish; crown whitish, spotted with red; the bottom part is whitish.

SPECTABILIS. Shell flattish, a little wrinkled, striate, reddish-white, with a chestnut band towards the crown, and another bay one at the margin.

CONSPURCATA. Shell solid, flattish, striate, black, with striate dots, within blueish, crown dirty-yellow.

MELANOSTICTA. Shell solid, flattish, striate, whitish, with cinereous rays and black dots, within blueish; crown a little pointed and whitish.

ATRA. Shell black, striate, with a paler crown; bottom with a brownish mark surrounded with a white horse-shoe shaped band.

SPECULARIS. Shell oval, convex, solid, glabrous, liver-colour, within and the crown brownish, the latter surrounded with a white border, and interrupted brownish band.

CANESCENS. Shell oval, black, within blueish, striate, the larger striæ flattened and grey; crown obtuse, brownish, with a whitish area.

VIRESCENS. Shell oblong, flattish, dilated on each side and striate, olivaceous, radiate, and spotted with white, within blue.

PULLA. Shell rounded, convex, longitudinally striate, and transversely wrinkled, brownish, within russet-brown, with whitish and brownish rays, and two milk-white bands above.

REVOLUTA. Shell sub-oval, crenate, striate, ochraceous, with red spots and rays, broader on one side; margin revolute.

SQUAMATA. Shell ovate, convex, striate, the striæ scaly, varied with white and black; crown nearly central, grey.

TESTACEA. Shell ovate, very finely striate, testaceous, with three transverse brownish rings, within pale yellow, with a whitish bottom.

CAPILLARIS. Shell ovate, thin, brown, with darker bands, and paler striæ, within brownish; crown and bottom white.

GLAUCA. Shell ovate, narrower on one side, very finely striate, blueish, with a white band towards the margin, and another blueish one; crown and margin white.

OBSCURA. Shell ovate, flattish, striate, varied with yellowish and brown, dotted with green, within brown, crown bay.

PATELLA.

EXOLETA. Shell oval, sub-convex, unequally striate, whitish, with a few black lines reaching half way; bottom with an ochraceous spot.

AFFINIS. Shell oval, flattish, solid, with a few black rays reaching half way; the bottom is marked with a white spot.

* **ROTALIS.** Shell white, opaque, flat, round, with a regular toothed margin. It is found occasionally at Sandwich; is very minute and rare.

FUSCATA. Shell ovate, convex, very finely striate, and varied with brown.

MELLIA. Shell rounded, solid, glabrous, honey-colour, within white; crown brownish; margin spotted with brown, and silvery within; bottom with a liver-colour spot.

ANCEPS. Shell solid, glabrous, a little pointed, pale chestnut, within pale flesh-colour.

GUINEENSIS. Shell ovate, convex, very smooth, one side broader and chestnut-coloured, the other with the crown pale yellow; margin flesh-coloured on each side.

COMPLANATA. Shell depressed-hemispherical, obsoletely cancellate, varied with white and brownish.

VIRGATA. Shell ovate, longitudinal striate, whitish with brown rays and crown, within perlaceous.

NIVEA. Shell subconic, solid, glabrous, snowy, with transverse concentric rings. Inhabits Africa.

GRISEA. Shell oval, with crowded radiate grooves, within polished; crown nearly central. It inhabits Africa.

NAVICULA. Shell narrow, with decussate striæ, rosy with a whitish callous belt on one side in the middle, and whitish bottom, the margin is revolute on each side.

CINGULATA. Shell suboval, obsoletely striate, ferruginous, with two elevated obscurely barred belts; crown nearly central.

SCARPA. Shell clear white, with undulate striæ, narrow, the broader side with an acute callus, the narrower side repand.

* **PARVA.** Shell small, entire, without gloss, whitish, faintly radiate with red. This is described and figured by Donovan. It is found on the Devonshire coasts, but is very rare.

Section E. *With the crown or tip perforated.*

* **FISSURA.** Shell oval, conic, with reticulate striæ cleft on the fore-part; crown recurved. It is found on divers parts of the coasts of Europe and Barbary, and in this country. It has been described by Donovan, Pennant, and others.

FISSURELLA. Shell grooved and perforated on the fore-part; crown recurved. It is found adhering to stones in the Iceland seas.

PUSTULA. Shell oval, gibbous, convex, with reticulate striæ, and crenate margin. It inhabits the Mediterranean, Atlantic, and Indian seas.

* **GRÆCA.** Shell ovate, convex, reticulate; the margin crenulate inwardly. Described and figured by Donovan, Pennant, Lister, and other naturalists.

NIMBOSA. Shell ovate, striate, rugged, brown, with an oblong perforation. It inhabits the Mediterranean and Atlantic.

NUBECULA. Shell subovate, rugged, white, radiate with red, with an ovate perforation. It inhabits the Mediterranean, and resembles the last species.

PICTA. Shell ovate, solid, clouded, white and green, with oblique, undulate, alternate violet and white rays. It inhabits the straits of Magellan.

BARBADENSIS. Shell oblong, unequally striate, within

smooth, milk-white, with greenish bands; margin crenulate. It inhabits Barbadoes.

JAMAICENSIS. Shell whitish, transversely annulate, with longitudinal striæ covered with foliaceous tubercles, which are larger outwardly. This is found on the coasts of Jamaica and Barbadoes.

CAFFRA. Shell ovate, compressed, striate, very finely annulate, and radiate with black; bottom milk-white; perforation nearly central. It inhabits the Cape of Good Hope.

PERFORATA. Shell a little convex, transversely wrinkled, brownish with straw-coloured rays and spots, with longitudinal striæ alternately larger and fealy.

PORPHYROZONIAS. Shell oblong, compressed, unequally striate, white with five purple interrupted belts, within greenish-white. It inhabits North America. The perforation is very minute, orbicular, and surrounded on the inside with a red circle.

ROSEA. Shell very thinly striate, with alternate rosy and white rays; the perforation is oval.

SCUTELLUM. Shell each side repand, compressed; perforation radiate with grooves.

AVELLANA. Shell thin, white, with very fine striæ; perforation oblong, and divided by a ligament. There is a variety of which the margin is a little revolute on each side.

SPINOSA. Shell ovate, convex, white, with elevated striæ, growing thicker towards the margin, and marked with four rows of tubercles, the exterior tubercles are spinous.

DENTICULATA. Shell ovate, gibbous, whitish radiate with brown, within green, with elevated striæ; margin denticulate, crenate within.

NODULOSA. Shell ovate, convex, with elevated nodulous striæ, crossing thinner transverse ones, within white; crown black.

ANGUSTA. Shell depressed, white, with elevated striæ, every fourth of which is larger; perforation very narrow, and surrounded with a chestnut band on the outside, and a green one within.

INÆQUALIS. Shell ovate, convex, with decussate striæ, white, something triangular on the broader side; perforation surrounded with an elevated ring, round which is a red line.

MINUTA. Shell oval, pyramidal, reddish, with twelve elevated white striæ; bottom white; perforation oval, and nearly central; margin denticulate.

CONSPERSA. Shell ovate, convex, striate, yellowish, with red dots, and three oblique rays; within smooth, white.

RUBESCENS. Shell oval, striate reddish, with a white band in the middle; within it is white; margin entire; perforation linear.

SANGUINEA. Shell oval, thin, red, within greenish-white, with longitudinal striæ crossing finer transverse ones, which are rugged outwardly.

VENTRICOSA. Shell oval, ventricose, with decussate red striæ, within white; crown depressed, with an orbicular perforation; margin entire.

TRIRADIATA. Shell oval, flattish, striate, white with three brown rays, within whitish, perforation linear; margin entire.

TENUIS. Shell oval, a little convex, pellucid, longitudinally striate, white, with five half-brown rays; within yellowish.

MELANXONIAS. Shell convex, rosy, with an interrupted black

black band, and elevated unequal white striæ; within smooth, white; margin denticulate.

EFFUSA. Shell convex, rosy, with elevated nodulous white, alternately larger striæ; perforation round and large.

PUNICEA. Shell convex, chefnut, with unequal, crowded decussate striæ, within smooth, with alternate green and white bands; the perforation is round.

RUFESCENS. Shell convex, white shaded with red, and here and there striate with red, with granulate striæ; within it is smooth and white.

DIMIDIATA. Shell convex, above clear white, cancellate, longitudinally striate towards the margin, with a rosy band.

LACTEA. Shell convex, white, with unequal acute glabrous striæ; within smooth; the crown is rosy; the perforation large and orbicular.

PYRAMIDALIS. Shell convex, rosy, striate, with twelve smooth ribs; within smooth and greenish-white.

BICOLOR. Shell narrow, alternately radiate with chefnut and white, with unequal, thick, lamellate striæ; within smooth, white, margin crenulate.

ERYTHROCEPHALA. Shell convex, white, with red lines outwardly, and elevated rugged contrary striæ, ten of them larger; the margin repand and inflected.

VERRUCOSA. Shell above brown, striate, terminated by a knotty belt, beneath radiate with red, with acute nodulous ribs; margin denticulate, repand.

CONTAMINATA. Shell convex, with nodulous unequal ribs, the larger ones yellowish-brown, and marked with black dots disposed in interrupted circles, within greenish-white; the crown is cinereous.

ATRATA. Shell a little convex, narrow, white with red lines, outwardly spotted with black, with elevated, convex, unequal striæ; the perforation is oblong, with a chefnut margin.

CANDICANS. Shell white, chefnut-coloured towards the margin, with twenty alternately larger ribs; the crown is reddish, with an oblong perforation.

SUCCINCTA. Shell ovate, pointed, white, above smooth, with an elevated belt in the middle, dotted with ferruginous towards the margin, with elevated unequal smooth striæ; margin denticulate.

PUSILLA. Shell flattish, white, sub-orbicular, with twenty alternately less and shorter elevated striæ; the perforation is round, and surrounded on each side with a reddish circle.

FLAVESCENS. The shell of this species is very thin, pointed, finely striate, yellowish, with six brown rays; margin denticulate; crown cinereous, with an oblong perforation.

ANTIQUATA. Shell a little convex, obsoletely striate; white with red striate rays on the outside. The perforation is oblong and unequal.

GALEATA. Shell solid, ovate, compressed, within white; crown a little recurved, obtuse, with a linear perforation; margin crenate.

PERSONATA. Shell convex, with decussate lines and black rays. It inhabits the Falkland islands.

PATELLA, in the *History of Insects*, a name given by Lister, and some others, to a certain little husk or shell, found on the bark of the cherry, plum, and rose trees, and some others, containing an animal within, and useful in colouring. These patellæ are of a globular form, except when they adhere to the tree, and are of a shining chefnut colour in most kinds. The husk itself strikes a very fine crimson colour on paper, and within it is found a white maggot of no value: this, in time, hatches into a very small but beautiful bee.

The whole size of this bee is not more than that of half the body of an ant. They have the sting of bees, and the three spots placed in a triangle on the forehead, which are supposed to be eyes. They are black, and have a large round whitish or pale yellow spot upon the back. The upper pair of wings are shaded and spotted, but the other pair are clear.

The shells or husks deserve a trial, to find whether the colour they yield might not be brought to use; it is to be observed, that the deepest coloured husks afford the finest and deepest purple: they must be also used while the creature contained in them is in the maggot form; for when it is changed into the bee state, the shell is dry and colourless. Dr. Lister, who had observed these patellæ, went so far, on comparing them with the common kermes, as to declare that they were of the same nature with that production: but this history of their being the workmanship of a bee, to preserve her young maggot in, is not agreeable to the true history of the kermes; for that is an insect of a very peculiar kind. This author has been too justly censured for his precipitancy of judging of things, and perhaps has fallen into an error by means of it here.

It is very possible that this patella may be the same sort of animals with the kermes, but then it produces its young within this shell or husk, which is no other than the skin of the body of the mother animal; but as there are many flies, whose worms or maggots are lodged in the bodies of other animals, it may be, that this little bee here described, may love to lay its egg in the body of the proper insect now mentioned, and the maggot hatched from that egg may eat up the proper progeny, and, undergoing its own natural changes there, issue out at length in form of the bee. This may have been the case in some few which Dr. Lister examined, and he may have been misled by this to suppose it the natural change of the insect. Phil. Trans. N^o 72.

PATELLA *Fera*, the *wild limpet*, a name very improperly given by Rondeletius and Aldrovand, to the *auris marina*, or *concha Veneris*. This is by no means of the patella kind. See *EAR-shell*.

PATELLARIA, in *Botany*, from *patella*, a dish with a broad brim, a name first adopted by Ehrhart, in his *Phytopyllacium*, for some of the *Lichen* tribe; and retained by Hoffmann, *Pl. Lichenosa*, v. 1. 54, for what Linnæus termed *leprosi scutellati*. Acharius, in his *Prodrromus* 36, receives it on a larger scale, so as to admit the *leprosi tuberculati*, at least in part; such as afterwards, in his *Methodus*, constituted the genus of *Lecidea*. *Patellaria* is, in that work, sunk in his multifarious genus *Parmelia*; and though its idea is restored, in his more recent *Lichenographia*, the name has given place, apparently without necessity, to *Lecanora*. See *LICHENES* and *PARMELIA*.

PATELLARII, in *Mythology*, among the Romans, placed by Plautus in the lowest clats, and called by Horace also the little gods.

PATENA, in the *Romish Church*, the cover or lid of the chalice, made of the same metal with it, serving to hold the particles of the host, and give the people to kiss, when they make an offering.

It has its name *patena*, a *patendo*; and this is a general name, in Columella, for any broad flat vessel.

PATENODE, in *Geography*, a town of the island of Ceylon, near the E. coast; 78 miles E. of Candy. N. lat. 7°. E. long. 82°.

PATENTS, or *Letters PATENT*, in *Law*, the king's letters, sealed with the great seal, serving to convey the title

title or property of some grant, favour, privilege of a new establishment, or the like. See *LETTERS Patent*.

They have their name from their being delivered open, *et pateant omnibus*; by way of contradistinction from *letters de cachet*, or *literæ clause*, or *close rolls*, which are sealed.

Grants or letters patent must first pass by bill; which is prepared by the attorney or solicitor-general, in consequence of a warrant from the crown; and is then signed, that is, superferibed at the top, with the king's own sign manual, and sealed with his privy signet, which is always in the custody of the principal secretary of state; and then sometimes it immediately passes under the great seal, in which case the patent is subscribed in these words, "per ipsum regem; by the king himself." Otherwise the course is to carry an extract of the bill to the keeper of the privy seal, who makes out a writ or warrant thereupon to the chancery; so that the sign manual is the warrant to the privy seal, and the privy seal is the warrant to the great seal: and in this last case the patent is subscribed, "per breve de privato sigillo, by writ of privy seal."

It is to be noted, that patents differ from writs: a coroner is made by *writ*, not by patent.

To this office, enacted 18 Jac. I. belongs a clerk, &c.

PATENT, Letters, under the royal authority, confer on a person the exclusive privilege of making and selling any thing, so that no person be restrained in what he had before, or in using his lawful trade. The latter part of the definition of letters patent, or of a monopoly conferred by letters patent, will apply only to such as have been granted since the statute of the 21st of James, c. 2, commonly called the statute of Monopolies; prior to that period, letters patent conferred such a monopoly as interfered with the rights of other people, and restricted the freedom of trade.

Monopoly, in the latter acceptation of the word, has already been considered under its proper head: it existed in this kingdom unrestrained till the time of king John, who first granted municipal franchises. In the 25th year of the reign of Edward III. a statute was passed, which granted a free trade equally to foreigners and natives; this statute, however, was afterwards repealed; and monopolies that not only excluded foreigners from the advantages of English trade, but also injured the English nation at large, in order that the favourites of monarchs might be rewarded, or that the crown might be enriched, were established. During the reign of queen Elizabeth, they had spread so widely over the commercial transactions of the country, as to threaten the utter ruin of trade; when a list of only part of the commodities, which had been appropriated to monopolists, was read in the house of commons, a member cried, "Is not bread in the number?" "Bread," said every one with astonishment; "yes, I assure you," replied he, "if affairs go on at this rate, we shall have bread reduced to a monopoly before next parliament." At this period, most extraordinary powers were granted to the patentees; especially to those who held the exclusive privilege of selling saltpetre; they had the power of entering every house, and of committing what havoc they pleased in stables, cellars, and wherever they suspected saltpetre might be gathered. Hume.

It might have been supposed, that such a sagacious princess as Elizabeth would have perceived the evil consequences of granting monopolies; but either the reduced state of the royal funds, or her fondness for favourites, blinded her to the true interests of her people. Towards the end of her reign, however, the clamour of the country was so loud and general, that she sent a message to parliament, that she would immediately cancel the most oppressive of the exclusive privileges she had granted.

Before proceeding to the consideration of the statute of James I. already alluded to, it may be proper very briefly to take a view of the statute law, as it respects patents prior to that period. Monopolies are expressly contrary to Magna Charta, (29, 30.) The statute of Edward III. declared all grants by monopolies void; and when Philip and Mary granted by letters patent, to the mayor, bailiffs, and burghesses of Southampton, the exclusive privilege of importing Malmsey wine at that place, the judges were unanimous in their opinion, that the statute was void, as being against the freedom of trade. The principal statutes relating to patents in the 16th, and in the beginning of the 17th century, were in the 6th of Henry VIII., the 4th of Edward VI., and the 13th and 43d of Elizabeth.

The 21st of James I. ch. 3, is regarded as the declaration statute, by which the law on this subject is determined, and the 6th section of this statute particularly relates to patents for new inventions: this section contains the exception to the general law of the statute; the general law is, that all monopolies, and all commissions, grants, licences, letters patent, &c. for the sole buying, selling, making, using, &c. of any thing, shall be void; the excepting clause declares, that the law of the statute shall not extend to any letters patent, for the term of 14 years or under, granted to the true and first inventor, or inventors of manufactures, &c. which others, at the time of making such letters patent, shall not use. Sir Edward Coke, in his explication of this statute, gives it as his opinion, that the new manufacture, to which letters patent may be granted, must not be generally inconvenient; and this construction seems to have been adopted in his time, as he says, that a patent for a fulling-mill to thicken bonnets and caps, was set aside, on the ground, that it was holden inconvenient to turn labouring men to idleness. But this construction does not prevail now, and, indeed, if it did, it would effectually defeat the object of the sixth section of the statute of monopolies.

In the letters patent which are granted for new inventions, the improvements or inventions are first stated; the prayer of the petitioner to have the exclusive benefit for himself, or his assigns, for fourteen years, is next given; and this prayer is declared to be complied with, according to the statute. After commanding all subjects not to interfere with the patent right, and issuing a mandate to all officers not to molest the patentee in the exercise of it, the letters patent declare the patent void, if it appear that the grant is contrary to law, or prejudicial to the subject; or if the thing invented have been in use before the date of the grant; or if the patentee be not the inventor; or if it interfere with prior letters patent; or if the patent be transferred to more than five persons, or to any who act as a corporate body; or finally, if the nature of the invention be not described, or the description be not enrolled within one calendar month after the date of the letters patent. The letters patent conclude with a declaration, that they shall be construed in the most beneficial sense for the patentee.

A writ of *scire facias*, to repeal letters patent, lies in three cases; 1st, when the king grants the same thing to two or more persons; 2dly, when the king is deceived in his grant; and 3dly, when the grant is against law. The following rules are laid down by chief justice Lee, respecting the cases in which mistakes do not vitiate the grant: 1. If the king's intention is manifest, a false recital in a thing not material, will not vitiate the grant. 2. It is not vitiated in cases where the king is deceived, not by the false suggestion of the party, but by his own mistake, upon the surmise and information of the party. And 3. Although the king is mistaken in point of law, or matter of fact, if that is not part

part of the consideration of the grant, it will not vitiate it.

Patents for new inventions are granted for a term of fourteen years; and any royal grant for such purpose beyond that term is void. The fourteen years are accounted to commence from the date of the first letters patent. The patent right, however, may be extended by act of parliament.

A patent may be granted for an improvement on an old manufacture; but the improvement must be material and useful; and the patent extends to the improvement only. The statute considers a manufacture brought from abroad into the kingdom (provided it has not been practised before) as a new manufacture, and entitled to letters patent. No old manufacture in use before, can be prohibited by the grant of the sole use of a new invention; nor can a patent be granted for a method, or principle; its object must be some substantial thing produced.

The following rules are laid down by judge Butler, respecting the description required in the specification, which by the patent grant, the patentee is to cause to be enrolled in the high court of chancery. The invention or improvement must be disclosed, and described in such a manner, that others of the same trade may be taught to do the same thing for which the patent is granted: 2. He must describe it in such a manner, that the public, after the expiration of the term, may have the use of the invention in as cheap and beneficial way as the patentee himself; and therefore, if the specification describes many parts of a machine, &c., and the patentee uses only a few of them, or does not state how they are to be put together, the patent is void. 3. If the specification be in any part materially false or defective, the patent is against law, and cannot be supported.

The enrolment of the specification in the high court of chancery, where it is open to the inspection of every one, enables those who are inclined to purchase the machine, invention, &c., to become acquainted with its nature and merits; and, at the same time, prevents such as are employing their skill, time, and money on improvements, or inventions of a similar nature, from merely doing what has been done before.

With respect to the form of the specification, it must be under the hand and seal of the inventor; the enrolment must take place within one calendar month after the date of the letters patent; if the patentee passes over this time, it cannot be enlarged without an act of parliament for that express purpose.

When a patentee brings an action against any person for infringing his patent, it is incumbent on him to shew, that the invention was new, and that the specification is full and complete.

It is frequently for the convenience or interest of a person, who has invented or improved a machine, &c. to delay taking out a patent for it; in this case, he may enter a *caveat*. A *caveat* will protect his invention or improvement for the space of one year, after which, if he have not brought his contrivance to maturity, he may renew it again for an equal period, and so on for any successive number of years. The caveat must be delivered at the chambers of the attorney and solicitor-general; and if an application be made for a patent for an invention of the same nature, notice is given to the person who has entered the caveat: if he requires it, the attorney-general gives a separate audience to each of the rival inventors, and makes his report to the king, according to his opinion respecting the priority of invention. A petition to the king, stating the nature of the invention, and praying letters patent, accompanied by an oath taken before

a master in chancery, that the invention is new, are the steps preparatory to taking out a patent. Separate patents must be taken out for England, Scotland, and Ireland; but in a patent for England, the patentee may, on the payment of a small additional sum, have the colonies and plantations abroad included. The petition and oath are referred by the secretary of state for the home department to the attorney-general, and on his report, recommending letters patent, his majesty issues his warrant, in consequence of which the bill is made out, which is the grant of his majesty, and of this the patent is the transcript; the nature of the specification, and the enrolment of it, have been already noticed.

Having thus considered letters patent in a legal light, we shall conclude with a few remarks on them, as a subject of political economy. It is plain from what we have stated, that they are the remains of that system of monopoly, which formerly prevailed in this and all the other countries of Europe; and so far, at first sight, they may appear objectionable. But when we consider the object for which they are granted, we shall probably be of opinion, that it takes them completely out of the force of those objections, which are so justly brought against all monopolies.

It is evident, that no man will bestow his time, ingenuity, and money, in endeavouring to invent or improve any thing, unless, when he has succeeded, he is secure in being rewarded. This reward can be secured to him, only by granting him, for a certain number of years, the exclusive privilege of his invention or improvement; or by government purchasing it from him. In the former case, while his patent right lasts, he has a monopoly; he may put what prices on his invention he pleases; or he may execute it in a careless or improper manner; but, on the other hand, the public will in a great measure be protected from too high a price, by the alternative they have, of following the old methods; and if they gain by purchasing the new invention, the price put upon it by the inventor can hardly be said to be exorbitant. With respect to his doing his work in a careless manner, the public are equally guarded against this; for by such conduct, he would act against his own interest, and the sale of his invention.

If, indeed, we could suppose that government would examine, in all cases, thoroughly, impartially, and scientifically, into the merits of every invention, it might be better for them to throw it open to the public, by rewarding the inventor, though in this case, the nation at large would pay for what directly and materially benefited only certain classes, whereas, by letters patent, those reward the inventor, whose interest it is to reward him. On the whole, therefore, the present mode is the best, with perhaps this alteration, that the letters patent should vary in their duration, according to the importance of the invention, and the money and time expended by the inventor.

PATENT of *Peerage*. See PEER.

PATENT of *Precedence*. See PRECEDENCE.

PATENT *Rolls*. See ROLLS.

PATENT *Writs*. See WRITS.

PATENT *Leaf*, in *Botany*. See LEAF.

PATENTEE, is he to whom the king grants letters patent.

PATEQUEMADE, in *Geography*, a town of the island of Cuba; 20 miles E. of Vella del Principa.

PATER, or PADER, a river of Germany, which rises near Paderborn, and runs into the Lippe, about one mile E. of Neuhans.

PATER *Patrus*, among the Romans, the first and principal person of the college of heralds, which formed a kind of board or council, to examine the differences that arose between

tween neighbouring states, and endeavour amicably to accommodate the same.

PATERA, among *Antiquaries*, a goblet, or vessel, used by the Romans in their sacrifices, in which they received the blood of their victims, offered their consecrated meats to the gods, and with which they made libations.

The word is formed from *pateo*, *I am open, quod pateat*, because it had a great aperture; in contradistinction to bottles, &c.

On medals, the patera is seen in the hands of several deities; and frequently in the hands of princes, to mark the sacerdotal authority joined with the imperial, &c.

Hence F. Joubert observes, that besides the patera, there is frequently an altar, upon which the patera seems to be pouring its contents.

The patera was of gold, silver, marble, brass, glass, or earth; and they used to enclose it in urns with the ashes of the deceased, after it had served for the libations of wine and liquors at the funeral. See *PATRA*.

The patera is an ornament in architecture, frequently introduced in friezes, fascias, and impostes, over which are hung festoons of husks or flowers; and they are sometimes used by themselves, to ornament a space; and in this case it is common to hang a string of husks or drapery over them: sometimes they are much enriched with foliage, and have a mask or a head in the centre.

PATERA, in *Geography*, a town of Asiatic Turkey, in Natolia. This town, originally called "Patara," was a city of Lycia, and famous for a temple of Apollo, said to have been equal to that of Delphos, for its oracle, magnificence, and riches, and this god is said to have divided his person between them, being six summer months at Delphos, and the six winter months at Patara. Ptolemy Philadelphus ordered it to be called "Arfinoe," but it recovered its former name, and is celebrated as the place of the martyrdom of St. Leo and St. Gregory. It was once the see of a bishop, but is now a mean place; 8 miles E. of Ekenide.

PATERCULUS, VELLEIUS, in *Biography*, a Roman historian, was descended from an ancient family in Campania, which had borne various important offices in the state. He was himself a military tribune; and served under Tiberius in Germany as commander of the cavalry, and accompanied him in all his expeditions during nine years. After having been quaestor he was nominated praetor. These are all the facts relating to the personal history of Paterculus that have come down to us. As he was the friend to Sejanus, it has been conjectured that he was involved in the ruin of that minister. Paterculus is known principally by his abridgment of the Roman History, addressed to the consul M. Vinicius, but of this work the greater part has perished, and what remains is extremely deficient, only one MS. having been discovered. The style of this author is pure and elegant. In chronology he is more exact than was customary with most ancient writers, and he has introduced many brief but curious notices of the foundation of cities and states. Few writers excel him in drawing characters, sketching, with few strokes, a striking and masterly likeness. He was the friend and adulator of Tiberius and Sejanus, and his attachment to monarchical power has biased him in his representation of the actions and characters of the republican party. The best editions of his history are those of Burmann 1719, 1744, and of Ruhmann in 1779.

PATERO. See *PADRERO*.

PATERNA, in *Geography*, a town of Spain, in New Castile; three miles E. of Alcaraz.

PATERNITY, the quality of a father.

Vol. XXVI.

PATERNO, in *Geography*, a town of Sicily, in the valley of Demona, built on the ruins of Ilybla, so celebrated for its honey. Hybla was ruined by the Saracens, who built a castle there, upon an ancient crater. The Normans erected a new building on the foundation of this ruined castle, which serves as a prison. The ruins of many baths erected here are still visible. The waters of different qualities which supplied these baths are now lost and so intermingled, as to cause the pestilential air of Paterno, which, nevertheless, contains a population of from 10 to 12,000 persons; 15 miles W. of Catania.—Also, a town of Naples, in Principato Ultra, three miles N. of Monte Marano.

PATER-NOSTER, the Lord's prayer, a form so called from the two initial words thereof in Latin.

PATER-NOSTER is also used for a chaplet or string of beads; because serving to number the rehearsals of that prayer.

PATER-NOSTERS, in *Architecture*, a sort of ornaments cut in form of beads, either round, or oval; used on baguettes, astragals, &c.

PATER-NOSTERS, in *Geography*, rocks in the Atlantic, on the S. side of the entrance into the bay of St. Helena. S. lat. 32° 20'.—Also, rocks near the N. coast of the island of Jersey.

PATER-NOSTERS, *Little*, a cluster of thirteen rocks in the East Indian sea, between the islands of Borneo and Celebes, called by the Malays, "Pulo Balabataken." They are covered with trees, and have navigable channels between them.

PATER-NOSTERS, *Great*, a cluster of shoals and islets in the East Indian sea, about 120 miles long from N.E. to S.W. and 30 broad. S. lat. 6° 30' to 7° 42'. E. long. 117° 10' to 119° 10'.

PATER-NOSTRE', in *Heraldry*. A cross pater-nostre is a cross made of beads. This cross is to be so shadowed in drawing, as that the sphericity of the beads may appear, to distinguish them from besants.

PATERSONIA, in *Botany*, very deservedly named by Mr. R. Brown in honour of his friend colonel William Paterson, a gentleman to whose researches at the Cape of Good Hope many years ago, and more recently in Norfolk Island, as well as New South Wales, of which last settlement he has long been lieutenant-governor, botany is much indebted. Brown Prodr. Nov. Holl. v. 1. 303. Ker in Curt. Mag. v. 26. 1041. Ait. Hort. Kew. ed. 2. v. 4. (Genofiris; Labill. Nov. Holl. v. 1. 9?)—Class and order, *Monadelphia Triandria*. Nat. Ord. *Ensatæ*, Linn. *Irides*, Juss.

Gen. Ch. *Cal.* Sheath many-flowered, of two compressed, keeled, rigid leaves, embracing each other, with numerous inner membranous scales, separating the flowers. *Cor.* of one petal, salver-shaped, regular; tube very slender, about as long as the sheath; limb in six deep segments, three of them very large, ovate, horizontal, the three alternate ones very small, erect. *Stam.* Filaments three, united into a tube nearly all the way up, longer than the shorter segments of the corolla; anthers erect, oblong. *Pist.* Germen within the sheath, below the corolla, angular; style capillary, about as long as the stamens, generally swelling towards the top, contracted at the apex; stigmas three, dilated, somewhat hooded, undivided. *Peric.* Capsule membranous, prismatic, with three blunt angles, three cells and three valves. *Seeds* numerous, roundish.

Eff. Ch. Sheath of two leaves. Three inner segments of the corolla equal, minute, erect. Filaments distinct at the top. Stigmas dilated, undivided.

Obf. There can fcarcely be a doubt that this is the fame genus which Labillardiere calls *Genofiris*, however incorreétly he may have defcribed it; happily however his name for it is exceptionable, being compounded of an eftablifhed one, *Iris*.

The fpecies known are feven, all perennial herbaceous fibrous-rooted plants, with either none, or a fhort, moftly fimple, *ftem*. *Leaves* fword-shaped, narrow and compact. *Flower-ftalk* either radical, or terminal, fimple, naked. *Flowers* coming out in fucceffion, handfome, but very fhort-lived, blue, without fpoats. *Anthers* and *ftigmas* yellow. *Capsules* nearly feffile, invefted with the theaths. *Seeds* ufually infered into the inner angle of the cell; fometimes into a central column.—The fpecies, as far as known, are all natives of New Holland, moftly without the tropic, growing in open, barren, ftony or fandy places, near the fhore; rarely in moift meadows.

1. *P. fericea*. Silky Paterfonia. Curt. Mag. t. 1041. —Stigmas deflexed. Sheath, and upper part of the ftalk, filky. Leaves ftraight, finely fringed, doubly ftriated, woolly at the bafe of their keel.—Native of the country about Port Jackfon, as well as of the tropical part of New Holland. It was one of the firft plants of which fpecimens were fent to England by the fettlers. Mefirs. Lee and Kennedy raifed it from feed, and it flowered with them in 1807, being kept in the greenhoufe. The *leaves* are feveral, erect, narrow, rigid, and elastic, about a foot high, in two ranks. *Flowers* violet, not unlike *Tradefcantia virginica* at the firft glance, but rather larger, without fcent.

2. *P. lanata*. Woolly Paterfonia.—Stalk round, ftriated, longitudinally woolly, as well as the fheath. Leaves flightly convex, fimplly ftriated; woolly at the bafe.—Obferved by Mr. Brown, in the fourth part of New Holland. The *ftigmas* were not remarked.

3. *P. longifolia*. Long-leaved Paterfonia.—Stigmas deflexed. Sheath and ftalk filky. Leaves linear, narrow, many times longer than the ftalk; fringed below the middle with fpreading or inflexed hairs.—From Port Jackfon.

4. *P. media*. Intermediate Paterfonia.—Stigmas deflexed. Inner fegments of the corolla but one-fourth as long as the tube of the ftamens. Sheath filky. Flower-ftalk fmooth, longer than the ftem. Keel of the leaves woolly at the bafe.—From Port Jackfon.

5. *P. glabrata*. Smooth Paterfonia.—Stigmas deflexed. Inner fegments of the corolla half as long as the tube of the ftamens. Flower-ftalk longer than the ftem, very fmooth and fhining, like the fheath. Keel of the leaves woolly at the bafe.—From the fame country.

6. *P. glauca*. Glaucous Paterfonia. (*Genofiris fragilis*; Labill. Nov. Holl. v. 1. 13. t. 9.)—Stigma erect. Style flightly thickened at the top. Sheath about three-flowered, ftriated, fmooth. Leaves linear, rather convex, naked at the edges and bafe, twice as long as the fender, thread-shaped, fmooth ftalk.—Gathered by Labillardiere, in Van Diemen's land; by Mr. Brown near Port Jackfon. The *leaves* are enveloped at the bafe by numerous fhorter leaf-like feales. *Corolla* blue, rather fmall than in *P. fericea*.

7. *P. occidentalis*. Weft-coaft Paterfonia.—Stigma erect. Style of equal thicknefs throughout. Sheath about five-flowered, even. Stalk very fmooth, as long as the fword-shaped leaves, which are naked at the edges and bafe.—Native of the fouth-weft coaft of New Holland, where it was gathered by Mr. Brown, to whole work we are indebted for the fpecific diftinétions of all the fpecies.

PATETHISÆ UVÆ, a name given by the ancients to grapes which were fuffered to remain on the vine till they

were greatly dried and withered. They were alfo called *patete uvæ*, and were fuffered to hang thus to make a peculiar wine called *passum*.

PATGONG, in *Geography*, a town of Hindooftan, in Bengal; 120 miles W. of Beyhar.

PATH, in *Rural Economy*, a track or road acrofs a field: a path acrofs arable land is as great a lofs as a crooked hedge, and fhould always be avoided as much as poffible, both in arable and pature grounds, in the laying them out at firft, where they are directed, on the inclofing of wafte or other lands.

PATH of the *Vertex*, a term frequently ufed by Mr. Flamfteed, in his doctrine of the fphere, fignifying a circle, defcribed by any point of the earth's furface, as the earth turns round its axis.

This point is confidered as vertical to the earth's centre; and is the fame with what is called the vertex or zenith in the Ptolemaic projeétion.

The femi-diameter of this path of the vertex is always equal to the complement of the latitude of the point or place that defcribes it; that is, to the place's diftance from the pole of the world.

PATH fly, the name given by us to the fly called in Latin *humifuga*; it is found in foot-paths, and fuppofed to live by fucking the ground; it is of a grey colour, ftreaked with duiky white.

PATHETIC, παθητικός, from παθος, *paſſion*, *emotion*, fomething that relates to the paſſions; and particularly that is proper to awake or excite them.

In *oratory*, pathetic is applied to that part of a difcourfe, or to that mode of expreffion, that is immediately addreffed to the *Paſſions* (which fee), and which feems to render it interefting and impreffive. In this part of a difcourfe, if any where, eloquence reigns, and exerts its power. On the head of the pathetic, Dr. Blair has laid down the following ufeul direétions. It fhould *firft* be confidered whether the fubjeét admit of the pathetic, and render it proper; and if this be the cafe, in what part of the difcourfe it fhould be attempted. An attempt to excite the paſſions in a wrong place, may expoſe an orator to ridicule. He fhould be careful, in the firft place, to bring over to his fide the underftanding and judgment; otherwife he is not likely to produce any beneficial or permanent effect. That the emotion may not only remain, when he ceafes to ſpeak, moft writers aſſign the pathetic to the peroration or conclufion, as its natural place; and when all other things are equal, this is the impreffion that one would chooſe to make laſt, leaving the minds of the hearers warmed with the fubjeét, after argument and reaſoning had produced their full effect. But wherever the pathetic is introduced, it is recommended, *ſecondly*, never to fet apart a head of a difcourfe, in form, for raifing any paſſion; never to give warning that you are about to be pathetic, nor to call upon your hearers to follow you in the attempt. This almoſt never fails to prove a refrigerant to paſſion. The indireét method of making an impreffion is likely to be more fucceſsful. This may often be done more happily, in a few inſtances inſpired by natural warmth, than in a long and ſtudied addreſs. *Thirdly*, it fhould be confidered, that there is a great difference between ſhewing the hearers that they ought to be moved, and aétually moving them. To every emotion or paſſion Nature has adapted a fet of correſponding objects; and without ſetting theſe before the mind, it is not in the power of any orator to raife that emotion. The foundation of all fucceſsful execution in the way of pathetic oratory, is to paint the object of that paſſion which we wiſh to raife, in the moſt natural and ſtriking manner; to deſcribe it with ſuch circumſtances

circumstances as are likely to awaken it in the minds of others. Every passion is most strongly excited by sensation; next to the influence of sense is that of memory; and next to memory is the influence of the imagination. Of this power, therefore, the orator must avail himself, so as to strike the imagination of the hearers with circumstances, which, in lustre and pleasingness, resemble those of sensation and remembrance. For this purpose, *fourthly*, the only effectual method is to be moved yourselves. The inward emotion of the speaker adds a pathos to his words, his looks, his gestures, and his whole manner, which exerts a power almost irresistible over those who hear him. *Fifthly*, it is necessary to attend to the proper language of the passions. We should observe in what manner any one expresses himself who is under the power of a real and strong passion; and we shall always find his language unaffected and simple. It may be animated, indeed, with bold and strong figures, but it will have no ornament or finery. He is not at leisure to follow out the play of the imagination. A person who takes time to polish and adorn his style, will infallibly cool his own ardour; and then he will touch the heart no more; his composition will become frigid; and it will be the language of one who describes but who does not feel. Although he may amuse the fancy, he will not reach the heart. In the former case, labour may appear; but the latter must be the work of nature only. *Sixthly*, nothing of a foreign nature should be interwoven with the pathetic part of a discourse. All digressions must be avoided; beauties must be sacrificed; comparisons are always dangerous, and generally quite improper, in the midst of passion. Reasoning is unseasonable, especially if it be pursued in a long and subtle train, when the principal aim is to excite warm emotions. Lastly, the pathetic should not be prolonged too much. Warm emotions are too violent to be lasting. Study the proper time and mode of making a transition from the passionate to the calm, recollecting a maxim, which, though trite, is just, that nothing dries up sooner than a tear. Beware, therefore, of straining passion too far, and of raising it to unnatural heights, as well as of prolonging its duration. Dr. Blair, to whose "Lectures" (vol. ii.) we refer for the illustration and application of these rules, closes with setting before his readers the example of Cicero in his last oration against Verres, wherein he describes the cruelty exercised by Verres, when governor of Sicily, against one Gavius, a Roman citizen. But our limits forbid our enlarging. See PERORATION and STYLE.

PATHEIC, in *Music*. The general import of this word, which is purely English, is so well known, as seemingly to need no explanation; yet, to render music pathetic, so many circumstances must concur, that it has been thought necessary by Rousseau to point them out. The poetry, the musical composition, the figure, countenance, tone of voice, expression, and situation of the character represented, must all combine to produce the full effect of a pathetic air. All are requisite in dramatic and theatrical music, which tend to move and paint the great passions, particularly those of grief and sorrow.

All the expression which the French can give to pathetic airs, is to drag, reinforce the notes, and howl; and in so slow a movement, that all sentiment of measure is effaced. Hence the French think, that whatever is slow is pathetic, and all that is pathetic ought to be slow.

They have airs which become gay and playful, or tender and pathetic, as they happen to be sung quick or slow. Such is the advantage of French melody; it serves for whatever they please: *fiet avis, et, cum volet, arbor*.

But Italian music has not the same advantages. Each song,

each melody, has its distinct character so strongly impressed on it, that it is impossible to destroy the pathos of its accent and melody, which is felt in all measures, even in those the most lively. French airs change their character, as the time is accelerated or retarded. Each Italian air has its movement so determined, that it cannot be altered without annihilating the melody. An air thus disguised, does not change its character, it loses it; it is no longer melody, it is nothing.

If the pathetic character is not in the movement, we cannot say that it is in the genus, the melody, or the harmony: as there are pieces equally pathetic in the three genera, the three modes, and all the harmony imaginable. The true pathetic is in the accents of passion, which are not to be taught by rule; but let genius find, and the heart feel, without applying to art to give the law.

Nieuwentyt tells us of a musician at Venice, who excelled in the pathetic to that degree, that he was able to play any of his auditors into distraction; he adds, that the great means he made use of was the variety of motions, &c.

PATHEICUS, in *Anatomy*, a name given by some anatomists to the nerve of the fourth pair, or nervus trochlearis. See NERVE.

PATHEICHEAD, in *Geography*, a considerable manufacturing town in the parish of Dyfart, and county of Fife, Scotland, is situated on the acclivity of a hill, looking towards the Frith of Forth, at a short distance to the north-eastward of the ancient burgh of Kirkcaldy. It is divided into two parts, one called Dunnikier, and the other Sinclair-town, from the estates on which they happen to be respectively placed. Formerly Pathhead was noted for the number of its nail manufactories; but these have now considerably declined, and the inhabitants are chiefly engaged in different branches of weaving. There is no regular market held in this town; but it has the privilege of a large annual fair for woollen and linen cloths. According to the parliamentary returns of 1811, it contains 237 houses, and 1692 inhabitants.

On a free-stone rock, which projects into the Frith immediately below Pathhead, stand the venerable ruins of Riven's, or Raven's-Craig castle, which was granted, with the neighbouring lands, by James III. of Scotland, to William St. Clair, or Sinclair, earl of Orkney, on his resignation of that title. During the time of the commonwealth it was garrisoned by a party of Cromwell's troops, but is now uninhabitable. Beauties of Scotland, vol. iv. Sinclair's Statistical Account, vol. xviii.

PATHEICGNOMONIC, in *Medicine*, from *παθος*, a disease, and *γνωσκω*, I know, an epithet signifying that a symptom, or concurrence of symptoms, to which it is applied, is inseparable from, or exclusively characteristic of, a particular disease, and found in no other. There is, perhaps, no disease in which any single symptom can be strictly said to be pathognomonic; but the concise definitions of diseases given by the nosologists, should exhibit the congeries of symptoms which are pathognomonic. Thus the *four symptoms*, "fever, cough, dyspnoea, and pain in the chest," which constitute Dr. Cullen's definition of pneumonia, are the pathognomonic symptoms of inflammation of the lungs. See NOSOLOGY.

PATHEICLOGY, from *παθος*, a disease, and *λογος*, a discourse, signifies the science or doctrine of diseases.

As *Physiology* teaches the nature of the functions of the living body in a state of health; so *Pathology* relates to the various derangements of these functions, which constitute disease. Its objects, therefore, are to ascertain the various symptoms which characterise the different disorders of each

organ of the body, and especially the *diagnostic* and *pathognomonic* symptoms, which afford the means of discrimination between diseases that resemble each other; to determine the causes, both predisposing and exciting, by which diseases are induced; to point out the *prognosis*, or the tendency and probable event of each disease, from the changes and combination of the symptoms; and, lastly, to teach the *indications of cure*, and the nature and operation of the remedies adapted to the various circumstances and periods of diseases.

The general doctrines of pathology, however, we have already anticipated, under the head of DISEASE, an article of more popular reference. See also CAUSE, in *Medicine*; and NOSOLOGY, under which a classification of diseases will be found.

PATHOS, *πάθος*, *passion*, a term frequently used in speaking of the movements which the orator excites in his audience.

We sometimes also use the word for energy, or strength.

PATI, in *Geography*. See PATTÀ.

PATIA, a river of South America, which rises near Popayan, and runs into the Pacific ocean, N. lat. 2° 13'.

PATIALA, a town of Hindoostan, in the circar of Sirhind; 12 miles S.W. of Sirhind. N. lat. 30° 18'. E. long. 76° 5'.

PATIENCE, in *Botany*, the name by which some people call the monk's rhubarb; but the French, from whom we have borrowed the word, mean by it all the species of the *lapathum* or dock kind.

PATIENCE, in *Ethics*, is that virtue which preserves the mind firm and unbroken, under the evils of life; so that the spirits are kept from becoming tumultuous, and precipitating the sufferer into indecent or repining thoughts, words, or actions; and by which he is disposed to pay calm attention to the reasons of sacred philosophy, and to observe them.

PATIENCE, in *Geography*, a small island near the coast of America, in Naragansett bay, belonging to the state of Rhode island.

PATIENT, among *Physicians*, a person under the direction of a physician, or surgeon, to be cured of some disease.

Agent and PATIENT. See AGENT.

PATIENTIA, *Straits of*, in *Geography*, a channel of the East Indian sea, between the island of Bachian, and the S. coast of Gilolo.

PATIENTIÆ MUSCULUS, in *Anatomy*, the levator scapulae, so called, because it was supposed to be principally concerned in shrugging up the shoulders. See LEVATOR.

PATIMA, in *Botany*, a genus so named by Aublet from its Caribbean name, *Patima-rana*. Aubl. Guian. v. 1. 197. t. 77. Juss. 207. Lamarck Dict. v. 5. 70. Illustr. t. 159. —Class and order, *Pentandria Monogynia*. Nat. Ord. *Rubiaceae*, Juss.

Gen. Ch. *Cal.* Perianth superior, of one leaf, the limb with about five incisions. *Cor.* and *Stam.* unknown. *Pist.* Germen inferior, firmly united to the bottom of the calyx; style and stigma wanting. *Peric.* Berry green, roundish, crowned with the margin of the calyx, of four, five, or six cells. *Seeds* numerous, very small, imbedded in soft pulp.

Obf. Jussieu and Lamarck observe, that, although Aublet was unacquainted with some parts of the flower of this plant, yet he has shewn enough to satisfy them that it must be monopetalous, and of the natural order of *Rubiaceae*.

Ess. Ch. Calyx superior, almost entire, of six obtuse angles. Berry crowned by the calyx, mostly five-celled, many-seeded.

1. *P. guianensis*. Aubl. Guian. t. 77.—Native of low

marshy places in Guiana, bearing fruit in May. — *Root* perennial. *Stems* numerous, shrubby, erect, three feet high, tubular, cylindrical. *Leaves* opposite, on long stalks, very large, ovate-oblong, acute, smooth, entire. *Stipulas* intra-foliaceous, in pairs, short, acute, permanent, at the base of the footstalk. *Fruit* axillary, consisting of green berries, on longish solitary stalks.

PATIN, GUY, in *Biography*, a physician distinguished for his wit and learning, was born at Hodenc, in Bray, near Beauvais, in August, 1601. His parents being in humble life, though respectable, his first views were not very elevated. He was employed for some time in a printing-office at Paris, as corrector of the press, where his abilities gained him the esteem and friendship of Riolan, a celebrated physician. In consequence of this connection, he was led to turn his attention to medicine, and took the degree of doctor in that faculty in 1627, and was admitted a member of the Parisian body. He continued to reside as a practitioner in that metropolis, where he was more esteemed, however, for his learning, and the satirical vivacity of his conversation, than for his medical skill. Indeed, he was too much attached to personal independence to push his way at court or among the great, yet he had many persons of distinction among his friends, particularly the president de Lamoignon, who enjoyed his society as the greatest relaxation from the labour of public business. Patin was, however, very zealous for the maintenance of the honours and privileges of his faculty, and was elected dean in the two successive years 1650 and 1651; and, soon afterwards, was appointed successor to Riolan the younger, in the chair of medicine at the College Royal. He expressed himself in Latin with so much fluency and elegance, that his theses became the centre of attraction to the fashionable idlers of Paris. He was a great opponent of all innovations in medicine, but more especially of the doctrines and drugs introduced by the chemical physicians; and he pursued a violent course in the dispute, which at that time agitated the physicians of Paris, respecting the virtues of antimony. He was even profuse in his personalities against all who defended that medicine, and drew up a long register of the unsuccessful cases in which it had been employed, which he called the *Antimonial Martyrology*. He derided, however, the complicated and costly compounds and specifics, which the generality of practitioners were in the habit of prescribing; and was of opinion, that by means of the lancet and purgatives, and a few simple expedients, every thing within the power of the healing art might be accomplished; a rational and just view of the subject, if it had not been perverted by other false theories, and by strong prejudices with respect to bloodletting, and some particular articles of medicine.

This learned physician died in 1672, in the seventy-first year of his age. He had read much, and had collected an extensive and valuable library, with the contents of which he was well acquainted: but he wrote few works in his own profession, and these of little importance. He had projected a history of celebrated physicians, but this he never accomplished. After his death a great number of his letters were published, which have been the chief means of preserving his memory. Of these there are two collections; one addressed to various friends, printed in 1685 and 1692, two volumes 12mo; the other all written to his friend Charles Spon, of Geneva, and published by that family in 1718, two volumes 12mo. Patin's letters are an amusing miscellany of political and literary intelligence, biographical anecdotes, free opinions, medical history and criticism, with a plentiful mixture of spleen and sarcasm. It is difficult to say whether he lashes most severely the court and ministry, the clergy, or the chemical

mical doctors; but the pictures which he gives of the manners and sentiments of the time are in most respects equally just and lively. Eloy Dict. Hist. Gen. Biog.

PATIN, CHARLES, a physician and distinguished antiquary, was the second son of the preceding, and was born at Paris, in February, 1633. His father educated him with great care, and he made a very extraordinary progress in learning, having, at the age of fourteen, sustained theses on philosophy in Greek and Latin, before a large and splendid audience, at which there were thirty-four bishops present, besides many other persons of distinction. He was intended to be brought up to the bar, and even became a licentiate in law at Poitiers, and afterwards an advocate in the parliament of Paris: but he afterwards abandoned the profession of the law, and chose that of physic, in which he took the degree of doctor in 1656. He had not only begun to practise with reputation and success, but had also taught in the schools of the faculty of Paris, when he was obliged to quit France, from the fear of imprisonment. The cause of this disgrace is somewhat doubtful. By some it has been said, that, having been sent into Holland by a great prince, in order to buy up all the copies of a work of court scandal, and burn them on the spot, he saved a number of them, and dispersed them among his friends. His father, however, in one of his letters, lamenting his son's misfortune, gives no hint of such a fact, but mentions the discovery of some obnoxious books in his library. After spending a few years in travelling through Holland, England, Germany, and Switzerland, to Italy, he at length settled with his family at Padua, where he soon acquired the public esteem. In 1676, he was appointed to an extraordinary professorship of medicine in that university; and in 1681, he was transferred to the first chair of surgery; and ultimately, in 1683, to that of medicine. He fulfilled the duties of these stations with so much distinction, that the republic of Venice conferred on him the dignity of a knighthood of St. Mark. He was also elected a member of the *Academia Naturæ Curiosorum*, and he was for a long time chief and director of the Academy of the *Ricovrati*. He died at Padua, on the second of October, 1693. He left a considerable number of learned works, amounting to nearly 40, in the Latin, French, and Italian languages. Few of these relate to medicine, and those only in the form of detached orations; such as "Oratio Inauguralis de optima Medicorum Sectâ," "Oratio de Febribus,"—"De Avicenna,"—"De Scorbuto," &c. The works by which he is best known, relate to the numismatic, or medallic science, in which he was a great proficient. The following are upon that subject. "Familia Romanæ ex antiquis numismatibus ab urbe condita ad tempora D. Augusti," 1663, folio. This is chiefly founded on the work of Fulvius Ursinus. "Introduction à l'Histoire par la Connoissance des Medailles," 1665, 12mo. "Imperatorum Romanorum Numismata," 1671, folio. "Thesaurus Numismatum," 1672, 4to. "Practica delle Medaglie," 1673, 12mo. "Suetonius ex Numismatibus illustratus," 1675, 4to.; and some other pieces. In the way of medical biography, he published the lives of the professors of Padua, with the title of "Lycæum Patavinum, sive Icones et Vitæ Professorum Patavi, anno 1682, docentium." Pat. 1682, 4to.

The wife and two daughters of Charles Patin were learned women, and all members of the Academy of *Ricovrati*, at Padua, in which they distinguished themselves. Charlotte-Catherine, the eldest daughter, pronounced a Latin oration on the raising of the siege of Vienna, and published "Tabellæ selectæ," which contained an explanation of forty-one engravings from the most celebrated painters. Gabrielle-Charlotte, the youngest daughter, published a panegyrical

oration on Louis XIV., and a Latin dissertation on the phoenix on a medal of Caracalla, Venice, 1683. His wife was author of a collection of moral and Christian reflections. Eloy Dict. Hist. de la Med. Gen. Biog.

PATIN-Shoe, in the *Manege*. See **PATTEN-Shoe**.

PATINA, a name given to the rust of medals. See *Conservation of MEDALS*.

This rust, which, when genuine, gives value to medals, is sometimes counterfeited, and a false patina is substituted for that which is true. The false varnish is black, greasy, and shining, besides being very tender when touched with a needle or burin; while the ancient has none of these qualities, and is as hard as the coin itself. Sometimes, says Mr. Pinkerton, a light-green coat-like varnish is given, spotted with a kind of iron marks. It is made of sulphur, verdigris, and vinegar; and is often distinguished, among other marks, by hair-strokes of the brist with which it was laid on. Vico, cited by Pinkerton, gives the following hints concerning false patina. He says it is green, black, russet or brown, grey, and iron-colour. The green is made with verdigris; the black is smoke of sulphur; the grey is formed of chalk steeped in urine, in which the coin is left for some days. The russet is next to the natural, because it is a kind of froth which the fire forms from ancient coins; but when false it is too shining. To make it, they often take the large brass coins of the Ptolemies, because they are frequently corroded, and making them red-hot in the fire, put the coins upon them; and there adheres a fine patina. The process of iron colour Vico does not explain. Sometimes, he adds, they take an old defaced coin, covered with real ancient patina, and stamp it anew; but the patina is then too bright in the cavities, and too dull in the protuberances. It may further be observed, that the trial of brass coins with the tongue is not to be despised; for, if modern, the patina tastes bitter, or pungent; while, if ancient, it is quite tasteless.

PATINO, in *Geography*, an island in the Grecian Archipelago, which was the ancient Patmos. See **PATMOS**.

PATINOON, a town of Hindoostan, in Marawar; 72 miles N.W. of Ramanadporum.

PATIOQUA, a town of Mexico, in the province of Guaxaca; 63 miles S. of St. Yago de los Valles.

PATIS, in *Ornithology*, the name of a small sea-bird, described by Ovidius, and seeming to be the same with the storm-fink, described by Hoier, in his epistle to Clusius. It is a little larger than our sparrow, and skims the surface of the water very nimbly, and is supposed a forerunner of storms.

PATIXA, or *Grande River*, in *Geography*, a river of Brazil, which runs into the Atlantic, S. lat. 15° 50'.

PATKUL, JOHN REINHOLD, in *Biography*, was born of a noble family in Livonia, a northern province belonging to the crown of Sweden. The Livonians having been stripped of their privileges, and great part of their estates, by Charles XI., Patkul was deputed to make their complaint; which he did with such eloquence and courage, that the king, laying his hand upon his shoulder, said, "you have spoken in behalf of your country as a brave man, and I esteem you for it." Charles, however, who added the baseness of hypocrisy to the ferocity of a tyrant, was determined to punish the zeal and honesty which he had just before applauded, and in a very few days afterwards caused Patkul to be declared guilty of high treason, and condemned him to death. The hero, however, found means to escape into Poland, where he continued till Charles was dead. He now hoped that his sentence might have been reversed, but being disappointed in this expectation, he applied to Augustus, king of Poland, and solicited

cited him to attempt the conquest of Livonia from the Swedes; which he said might be easily effected, as the people were ready to shake off their yoke; and the king of Sweden, being a child, was incapable of compelling their subjection. Augustus took the hint, possessed himself of Livonia, and afterwards, when Charles XII. entered the province to recover it, Patkul commanded in the Saxon army against him. Charles was victorious, and Patkul entered into the service of the czar of Russia, with whom Augustus was in strict alliance. The czar sent Patkul, with the title of his ambassador, into Saxony, to prevail with Augustus to meet him at Grodno, that they might confer on the state of their affairs. This conference took place, and immediately afterwards the czar went from Grodno to quell a rebellion in Astracan. As soon as the czar was gone, Augustus, to the surprise of all Europe, ordered Patkul, who was then at Dresden, to be seized as a state criminal. The czar claimed him as his ambassador, and Charles demanded that he should be put into his hands. The latter obtained his wish, and cruelly put him to death, in the year 1707. Charles XII. has been generally censured for not extending to him his mercy, but it must not be forgotten that Patkul had incited foreign powers to attack his country when the king was a mere child, hoping that, under such circumstances, it would become an easy conquest. It has been said also in behalf of the king, that this is the only instance of his cruelty, and that in ordering the execution of Patkul he thought he was doing his duty. Nothing, however, can palliate the unfeeling barbarity of putting the veteran to the rack. The monarch was one of the credulous philosophers of the time, who believed in the possibility of discovering the methods of transmuting the baser metals into gold. Patkul, while under sentence of death, contrived so far to impose on the senate at Stockholm, as to persuade them that he had, in their presence, converted to gold a quantity of less precious metal. An account of the experiment was transmitted to the king, accompanied with a petition for the life of so valuable a subject; but Charles, blending magnanimity with severity, replied, that he would not do that for interest which he had refused at the call of humanity and the intreaties of friendship.

PATLADAH, in *Geography*, a circar of Bengal, bounded on the N.E. by Curriharry, on the S. and S.E. by Dacca, and on the W. by Goragot and Islamabad; about 30 miles long, and 16 broad. The chief towns are Chilmay and Dewangunge.

PATMOS, in *Ancient Geography*, an island in the Grecian archipelago, now denominated by navigators "St. Jean de Patino," celebrated in ecclesiastical history, on account of its being the place of St. John's exile, and still more from the revelations and visions which he received there, and which form the subjects of the Apocalypse, or Revelation, exhibits little more than arid rocks and numerous capes. Some Caloyers, or Greek monks, who inhabit a monastery built on an eminence, still shew the grotto where the sacred writer received his communications and wrote his book. But in this convent there is no library, and, indeed, it would be of little use, as among the 80 monks who reside there, three only were found who could read, and they made little use of their scanty knowledge. This island is little more than six leagues in circuit; considerably longer than broad, its direction being from N. to S., and its form very irregular. Its coasts are intersected by a variety of gulfs and coves, and are remarkable for the number of good harbours which they present to navigators, among which that of "Scala" is one of the finest in the Archipelago. But notwithstanding the advantages which these harbours might afford it as a place of trade, it presents to the view of the observer a very wretched

appearance. Vallies, which might insure abundance, are uncultivated, and from their state of abandonment and nakedness, offer, with the hills that surround them, only the same aspect of ruggedness and misfortune. Population, which follows in the train of agriculture and industry, is here singularly diminished, and while the monasteries swarm with sluggards, the fields become deserts. In the summer few men remain here; they all migrate to a distance to seek means of subsistence, or carry on with their caiques, a traffic which feeds, but does not enrich them. The women remain intrusted with domestic cares, and to make the most of a few pieces of land during the absence of their fathers or husbands; and that timid tribe hide or shut themselves up when they see strangers land in their island. Such is the account given of this desolate spot by Sonnini. Although it is destitute of wood and rivers, and almost without gardens, its spring-water is pure and its air healthy. The inhabitants are chiefly Greek Christians, sailors or ship-builders, who sail as far as Venice, whither they carry cotton and stockings of their own manufacture. The island abounds with rabbits, pigeons, partridges, and quails. The abbot of the convent already mentioned is prince of the island, and pays annually 1000 crowns to the grand seignor, besides presents to the captain pacha: 16 miles S.W. of Samos. N. lat. $37^{\circ} 24'$. E. long. $26^{\circ} 24'$.

PATMOUR, in *Geography*, a town of Hindoostan, in Golconda; 25 miles N.N.E. of Rachore.

PATNA, a very ancient city of Hindoostan, erected on or near the site of Pataliputra, or Patelpoo'ther, afterwards denominated Palibothra. This is the chief city of Bahar, and is very extensive and populous; built along the southern bank of the Ganges, about 400 miles from Calcutta, and 500 from the mouth of the river. As it is seated on an eminence, it is secure against the inundations, which, at particular seasons, are prejudicial and dangerous. Having been often the seat of war, it is fortified in the Indian manner with a wall and a small citadel. It is a place of very considerable trade. Most of the saltpetre imported by the East India company is manufactured within the province of Bahar. N. lat. $25^{\circ} 37'$. E. long. $85^{\circ} 21'$.

PATNA, a town of the province of Bukovina; 30 miles W. of Sucava.—Also, a river of Moldavia, which runs into the Milebow, at Foedna.

PATNOURA, a town of Hindoostan, in the circar of Kerieh; 55 miles N.W. of Maltoy.

PATOKA, a town of Hindoostan, in Dowlatabad; 30 miles N.W. of Darore.

PATOMA, a river of Russia, which runs into the Lena, N. lat. $59^{\circ} 53'$. E. long. $116^{\circ} 24'$.

PATOMACK. See **PATOWMACK**.

PATONCE, in *Heraldry*. A cross patonce is a cross flossy at the ends; from which it only differs in this, that the ends, instead of turning down like a fleur-de-lis, are extended somewhat in the patee form. He bears gules; a cross patonce, argent; by the name of Latimer.

PATOOK, or **PURTOCK**, in *Geography*, a river of Honduras, which runs into the bay, N. lat. $15^{\circ} 55'$. W. long. $84^{\circ} 25'$.

PATOS, a river of Brasil, which runs into the Atlantic, S. lat. $28^{\circ} 28'$.—Also, a town of Mexico, in the province of Zacatecas; 80 miles N. of Zacatecas.

PATOU, a town of Hindoostan, in the circar of Aurungabad; 45 miles E. of Aurungabad.

PATOUAL, a town of Hindoostan, in Baglana; 18 miles S.E. of Bahbelgong.

PATOWMACK, a large river of America, which rises by two branches, the northern and southern, originating in and

and near the Alleghany mountains, and forms, through its whole course, part of the boundary between the states of Virginia and Maryland. It passes by many flourishing towns, the chief of which are Shepherdstown, Georgetown, Washington city, Alexandria, New Marlborough, and Charlestown, or Port Tobacco. It is seven miles and a half wide at its mouth, and its soundings are seven fathoms. The distance from the capes of Virginia to the termination of the tide-water in this river, is above 300 miles, and it is navigable for ships of the greatest burden through nearly that distance; and the inland navigation it affords is much extended by the numerous and long rivers that run into it.

PATQUASHAGAMA LAKE, a lake of Canada, 450 miles W. of Quebec. N. lat. 48° 20'. W. long. 82° 5'.

PATRA, a town of Hindoostan, in Guzerat; 18 miles N.N.E. of Amood.

PATRA, a vessel of capacity among the Hindoos, to which, under a mythological aspect, a great deal of mysticism is attached. It is seen in the hand of Parvati, and of some other deities of avenging character, in the shape of a small basin or cup, and is said to be for the purpose of receiving the blood of her victims, which she is poetically represented to quaff. The patra is, however, still more mystically contemplated in India, as an emblem or type of the world, and is then called Argha-patra. The argha means a cup or dish, in which fruits or flowers are offered to the deities, and ought to be shaped like a boat, as some are still seen, but more usually of a round form. A rim round the argha represents the mysterious Yoni, and a boss or convexity in the centre refers to the navel of Vishnu, whence, according to some popular fables, the creative Brahma sprang on a lotos to perform his great work. We shall here notice no farther on this point than the coincidence of wild umbilical mysteries common to the mythologists of India, Egypt, and Greece. Such mythological coincidences are striking and curious, and we shall proceed to notice some connected with the subject of this article. The name, form, and use of it as a drinking vessel, or for oblation, reminds us at once of the patera of the ancients. See PATERA.

Invol. xiv. of the *Archæologia*, a description and plate are given of a Roman patera and vase dug up when sinking a ditch in Essex in June 1800. They were found near an ancient Roman road between Camulodunum and Camboritum. "The metal vase and patera merit attention, as none similar to the first have been figured or described in the works of the society; nor do I know that any like either have been presented for their inspection. The vase is of that form which Montfaucon has figured in his 2d vol. pl. 19. fig. 10, and calls a præfericulum, used by the Romans at their sacrifices, for pouring wine into the patera. See p. 88, where he controverts Festus's opinion that the præfericula were without handles. Another more nearly resembling that here presented is given in his 3d vol. pl. 24. fig. 9, and called by Beger an epichysis, but not allowed to be such by Montfaucon. The metal patera which belongs to the above, differs from the earthen pateræ, in general, by being bossed in the centre, a circumstance not easily to be accounted for, unless it was for the firmer fixing the præfericulum upon, when placed with the body at the time of interment." With the above Roman antiquities were found several little cups of Samian ware. "The uses of these elegant little cups have not," the antiquary continues, "that I know of, been ascertained by any author. The real purposes to which they were applied must remain at present in obscurity."

The learned author of this communication, Thomas Walford, esq. F. A. S. earnestly invites an explanation of these

several Roman antiquities. It is, perhaps, no explanation to state that the Hindoos, in their sacrifices and ceremonies, have immemorially used, and still use, articles exactly similar to those exhibited, with the above communication, in vol. xiv. of the *Archæologia*, pl. 4. and 5. But it is curious to see how nearly they agree in form. A comparison of the article in the plates just adverted to, with those in plates 83, 86. and 105. of the *Hindoo Pantheon*, will strikingly evince this. The "sacrificial vase," in the latter plate, has the same form, though more elaborately ornamented, as the above described præfericulum; and the others exhibit metallic circular pateræ, and the central embossment, which, though "not easily accounted for," is found among Hindoo mystics to have very profound allusions. The Roman patera has also the mysterious rim or Yoni, respecting which the reader may consult the work last referred to. Dr. Clarke, in his recently published "Travels," notices that "the pateras used by priestesses in the rites of Ceres, had this pyramidal node or cone in the centre. A priestess is represented holding one of these, on a bas-relief, in the vestibule of Cambridge University Library." Vol. ii. p. 334. *Greek marbles*, No. xv. p. 37. Similar articles are still used in the rites of the Hindoo Ceres; as are also the "little cups" described and exhibited in the *Archæol.* as above referred to, and in many of the plates of the *Hindoo Pantheon*. In India they are used for holding clarified butter, a common ingredient in the frequent oblations to fire; and unguents, and holy water, in the Sradha or funeral obsequies, and in other rites and ceremonies.

Adverting for a moment to the place near which the Roman patera was found, we may remark, without laying any stress on it, that Camulodunum might, by a determined etymologist, be derived from the Sanscrit word Kamal, or goddesses KAMALA, see that article. And long after this remark was written, we find such a derivation adopted in the 11th vol. of the *Asiatic Researches*, art. ii. ch. 4.

It is shewn under the article SIVA of this work, that any objects conical or pyramidal are peculiarly typical of that deity. The mysticisms connected with that igneous form, he being a personification of fire with the Hindoos, are endless. Sufficient, probably, thereon will be found under the articles LINGA, MERU, YONI, and others thence referred to; if not, the reader may farther consult those articles in the *Hindoo Pantheon*.

PATRÆ, or PATRAS, in *Ancient Geography*, a town of Achaia, on a promontory, N. of mount Panachaichus. It was more anciently called "Aroé," derived, as it is said, from *αρου*, *I labour*, and applied to it, probably from its being the first place of Achaia in which the inhabitants occupied themselves in labour. Patraus, one of the chiefs of the Achæans who were driven from Lacedæmon on the arrival of the Heraclidæ, enlarged and fortified Aroé, and gave it his own name. Of all the Achæans the inhabitants of Patras were the only persons who defended the Ætolians, when they were attacked by the Gauls. This incursion was probably that of the year 278 B.C., and this followed the irruption of this people into Macedonia, in the preceding year, when they were defeated. Augustus, allured by the situation of Patras, collected the scattered inhabitants, and re-established them. He also united several towns under its dominion, and conferred on the inhabitants all the advantages enjoyed by Roman colonies. In the time of Pausanias this town was adorned with a statue of Diana Laphria, an odeum, which, next to that of Athens, was the most beautiful in Greece, and a fountain near the temple of Ceres, where oracles were issued for the relief of bodily maladies. Pausanias says, that Patras contained more women than men, and that they employed

ployed themselves in spinning the silk of the country, and in the manufacture of stuffs.

PATRAS, in *Geography*, a sea-port town of the Morea, situated on the S. coast of the entrance into the gulf of Lepanto. (See the preceding article.) This town is the see of a Greek archbishop, and contains about 80 Christian families, 250 of Turks, and 108 of Jews. Consuls from England, Holland, and Venice, have been accustomed to reside here. The principal articles of trade are coarse oil, silk, honey, wheat, manna, &c. In the year 1447 this place made a brave defence against sultan Murat, and held out till peace was concluded, when the Morea was surrendered to the Turks. The port is choked with mud, and the road for vessels is very indifferent; 28 miles N.E. of Chiarenza. N. lat. 38° 33'. E. long. 21° 43'.

PATREE, a town of Hindooſtan, in Guzerat; 70 miles W. of Amedabad.

PATRES CONSCRIPTI, in *Antiquity*, a denomination given to the senators of Rome.

The first hundred senators, appointed by Romulus, were called simply *patres, fathers*; another hundred being added by Romulus and Tatius, upon the union of the two people, these latter were called *patres minorum gentium*, and the former *majorum gentium*.

At length Tarquinius Priscus, making up the number three hundred, the two latter classes were called *patres conscripti*, because *adscripti*, or written down to the former.

Livy gives a different account of their origin. See **CONSCRIPTI**.

Those afterwards chosen from among the knights were called *patres adlecti*.

PATREZ, a name for a sort of vermicelli, a paste made of flour and water, and formed into beads. This and all other kinds of vermicelli are often stained with saffron.

PATRI, GLORIA. See **GLORIA**.

PATRIA, in *Geography*, a town of Naples, in Lavora, near a lake to which it gives name; 13 miles N.W. of Naples.

PATRIAM, TRIAL PER, in *Law*. See **JURY**.

PATRIARCH, PATRIARCHA, formed of *πατρις, family*, and *αρχων, chief*, one of those first fathers who lived towards the beginning of the world; and who became famous by a long line of descendants.

Abraham, Isaac, and Jacob, and his twelve sons, are the patriarchs of the Old Testament. Seth, Enoch, &c. were antediluvian patriarchs.

Long life and a number of children were the blessings of the patriarchs.

The patriarchal government consisted in the fathers of families, and their first-born after them, exercising all kinds of ecclesiastical and civil authority in their respective households; and to this government, which continued till the time of the Israelites dwelling in Egypt, some have ascribed an absolute and despotic power, extending even to the punishment by death. In proof of this, they allege the curse pronounced by Noah upon Canaan, Gen. ix. 25; but it is replied that in this affair Noah seems to have acted rather as a prophet than a patriarch. Another instance of supposed despotic power is Abraham's turning Hagar and Ishmael out of his family, Gen. xxi. 9, &c.; but this furnishes no evidence of any singular authority vested in the patriarchs as such, and peculiar to those ages. The third instance alleged to the same purpose is that of Jacob's denouncing a curse upon Simeon and Levi, Gen. xlix. 7, which is maintained by others to be an instance of prophetic inspiration more than of patriarchal authority. The fourth instance is that of Judah with regard to Tamar, Gen. xxxviii. 24; concerning which

it is observed, that Jacob, the father of Judah, was still living, that Tamar was not one of his own family; and that she had been guilty of adultery, the punishment of which was death by burning, and that Judah on this occasion might speak only as a prosecutor. Jennings's *Jewish Antiq.* vol. i. p. 1, &c. Sydney's *Discourses concerning Government*, chap. i. sect. 7.

PATRIARCH is also used, in Christendom, for the bishops in possession of some of the grand sees, independent of the papal jurisdiction; or for the chief bishop over several countries or provinces, as an archbishop is of several dioceses; who hath several archbishops under him.

The patriarchate has been always esteemed the supreme dignity in the church: so that, to rise by degrees, the bishop had only under him the territory of the city of which he was bishop; the metropolitan commanded a province, and had for suffragans the bishops of his province; the primate was the chief of a diocese, and had several metropolitans under him; and the patriarch had under him several dioceses, and the primates themselves were under him. But this order was not always observed.

Usher, Pagi, De Marca, and Morinus, attribute the establishment of the grand patriarchates to the apostles. They suppose that the apostles, according to the description of the world then given by geographers, pitched on the three principal cities in the three parts of the known world; viz. Rome, in Europe; Antioch, in Asia; and Alexandria, in Africa: and thus formed a trinity of patriarchs.

Others, far from attributing this institution to the apostles, maintain that the name patriarch was unknown at the time of the council of Nice; and that, for a long time afterwards, patriarchs and primates were confounded together; as being all equally chiefs of dioceses, and equally superior to metropolitans, who were only chiefs of provinces. Hence it is that Socrates gives the title patriarch to all the chiefs of dioceses, and reckons ten of them. In effect, it does not appear, that the dignity of patriarch was appropriated to the five grand sees of Rome, Constantinople, Alexandria, Antioch, and Jerusalem, till after the council of Chalcedon, in 451. For when the council of Nice regulated the limits and prerogatives of the three patriarchs of Rome, Antioch, and Alexandria, it did not give them the title of patriarchs, though it allowed them the pre-eminence and privileges thereof. Thus, when the council of Constantinople adjudged the second place to the bishop of Constantinople, who, till then, was only a suffragan of Heraclea, it said nothing of the patriarchate.

Nor is the term patriarch found in the decree of the council of Chalcedon, whereby the fifth place is assigned to the bishop of Jerusalem; nor did these five patriarchs govern all the churches.

There were still many independent chiefs of dioceses, who, far from owning the jurisdiction of the grand patriarchs, called themselves patriarchs: such as that of Aquileia; nor was Carthage ever subject to the patriarch of Alexandria.

Mosheim supposes, that those prelates who enjoyed a certain degree of pre-eminence over the rest of the episcopal order, were distinguished by the Jewish title of patriarchs in the fourth century. *Ecccl. Hist.* vol. i.

The authority of the patriarchs grew by insensible degrees, till at length we find, that about the close of the fifth century, all affairs of moment, within the compass of their patriarchate, came before them; either at first hand, or by appeals from the metropolitans.

They consecrated bishops, assembled yearly in council the clergy of their respective districts; pronounced a decisive judgment in those cases where accusations were brought against

against bishops; and appointed vicars or deputies, clothed with their authority, for the preservation of order and tranquillity in the remoter provinces.

Nothing, in short, was done without consulting them; and their decrees were executed with the same regularity and respect as those of the princes.

It must, however, be observed, that the authority of the patriarchs was not acknowledged through all the provinces without exception. Several districts, both in the eastern and western empires, were exempted from their jurisdiction.

The Latin church was unacquainted with patriarchs till the sixth century; and the churches of Gaul, Britain, &c. were never subject to the authority of the patriarch of Rome, whose authority only extended to the suburbicary provinces. There was no primacy, no exarchate nor patriarchate, owned here; but the bishops, with the metropolitans, governed the church in common.

Indeed, after the name patriarch became frequent in the West, it was attributed to the bishops of Bourges and Lyons; but it was only in the first signification, *viz.* as heads of dioceses. Du-Cange adds, that there have been some abbots, who have borne the title of patriarchs.

PATRIARCH is also applied to the chief of several churches in the East, who live out of communion with the Roman church; such are the patriarch of the Armenians, residing in the monastery of St. Gregory; the patriarch of the Abyssinians, called *Abuna*; the patriarchs of the Cophti, the Jacobites, &c. See ARMENIANS, COPHTI, JACOBITES, &c. See also GREEK CHURCH.

PATRIARCHAL, in *Heraldry*. A patriarchal cross is that where the shaft is twice crossed; the lower arms or traverses being longer, and the upper shorter. Such a cross is said to belong to patriarchs, as the triple cross does to the pope.

PATRICA, in *Geography*, a town of Italy, in the Campagna di Roma; 13 miles S. of Rome.

PATRICIAN, PATRICIUS, in ancient Rome, a title given to the descendants of the hundred, or, according to others, of the two hundred first senators chosen by Romulus, and by him called *patres, fathers*.

Romulus established this order in imitation of the Athenians, who were divided into two classes, *viz.* the *επαλειδας, patricios*, and *δημοτικους, populares*.

Patricians, therefore, were originally the ancient nobility; in opposition to the plebeians.

They were the only persons whom Romulus allowed to aspire after the magistracy; and they exercised all the functions of the priesthood till the year of Rome 495.

But the cognizance and character of these ancient families being almost lost and extinguished, by a long course of years, and frequent changes in the empire; a new kind of patricians were at length set on foot, who had no pretensions from birth, but whose title depended wholly on the emperor's favour.

This new patriciate, Zofimus tells us, was erected by Constantine, who conferred the quality on his counsellors, calling them *patricii*, not because descended from the ancient fathers of the senate, but because they were the fathers of the republic, or of the empire.

This dignity, in time, became the highest of the empire. Justinian calls it *summam dignitatem*: in effect, the patricians seem to have had the precedence of the consules, and to have taken place before them in the senate; though F. Faber asserts the contrary. What embroils the question is, that the two dignities often met in the same person; because the

patriciate was only conferred on those who had gone through the first offices of the empire, or had been consuls.

Pope Adrian made Charlemagne take the title of patrician before he assumed the quality of emperor; and other popes have given the title to other kings and princes, by reason of its eminence.

PATRICIAN, *Patricius*, is also a title of honour frequently conferred on men of the first quality in the time of our Anglo-Saxon kings. See THANE.

PATRICIAN Deities, *Patricii Dei*, in *Mythology*, were Jaanus, Saturn, the Genius, Pluto, Bacchus, the Sun, the Moon, and the Earth.

PATRICIANS, in *Ecclesiastical Writers*, denote ancient sectaries who disturbed the church in the beginning of the third century; thus called from their founder Patricius, preceptor of a Marcionite called Symmachus.

His distinguishing tenet was, that the substance of the flesh is not the work of God, but that of the devil; on which account his adherents bore an implacable hatred to their own flesh; which sometimes carried them so far as to kill themselves.

They were also called Tatianites; and made a branch of the Eneratizæ.

PATRICIDE, PATRICIDIUM, the same with parricide.

PATRICK, SIMON, in *Biography*, a learned English prelate, was the son of a mercer at Gainsborough, in Lincolnshire, where he was born in the year 1626. Great care was taken of his education; and having been well grounded in classical learning, he was, in 1644, sent to Queen's college, Cambridge. He took his degree of B.A. in 1647, and in the following year was chosen fellow of his college. In 1651 he took his degree of M.A. and about the same time received holy orders from Dr. Joseph Hall, bishop of Norwich. He next became domestic chaplain to sir Walter St. John of Battersea, who presented him to that living towards the beginning of the year 1658. In 1661 Mr. Patrick was elected master of Queen's college by a majority of fellows, notwithstanding the king's recommendation of Mr. Anthony Sparrow; but the affair being brought before the king and council, judgment was speedily given against our author, and some, if not all, of the fellows who had voted for him were ejected. Upon the ejection of Dr. Manton from the rectory of St. Paul's, Covent-Garden, in 1662, Mr. Patrick was presented to that benefice by the earl of Bedford; and he won the affection of the parishioners, not only by his preaching and exemplary manners, but particularly by his constant residence among them, during the time of that awful calamity the plague. In the year 1666, being disgusted at some circumstances that happened at Cambridge, he entered himself of Christchurch college, Oxford, where he was at first incorporated bachelor, and soon afterwards was admitted doctor of divinity; and about the same time, he was appointed chaplain in ordinary to the king. In 1672 Dr. Patrick was made a prebendary of Westminster; and his next promotion was to the deanery of Peterborough, in 1679, where he completed and published, in the year 1686, "The History of the Church of Peterborough," from the manuscript of Simon Gunton, formerly a prebendary of that church. Dr. Patrick made very considerable additions to it, and added a supplement, containing a fuller account of the abbots and bishops of Peterborough than had been drawn up by Mr. Gunton. In 1680 Dr. Patrick had the offer of the valuable living of St. Martin's-in-the-Fields from the lord chancellor Finch; but he declined accepting it, on account of the regard which he felt for his parishioners of Covent-Garden; and on this occasion

he recommended Dr. Thomas Tennison, who was presented to that rectory. During the reign of James II., Dr. Patrick, in opposition to all his worldly interests, shewed his zealous attachment to the Protestant religion, by writing and preaching against the errors of the church of Rome. The sovereign condescended to reason with the doctor on the subject, but to no purpose: he told the king very plainly, "that he could not give up a religion that was so well proved as that of the Protestants." His zeal went much farther than this: he opposed, to the utmost of his power, the reading of the king's declaration for liberty of conscience, which was published in favour of the Papists; and he assisted Dr. Tennison in establishing a school at St. Martin's, to counteract the influence of the Popish one opened at the Savoy, for the purpose of making converts of the children of poor Protestants. At the revolution, he was called upon to preach before the prince and princesses of Orange, who paid him particular attention; and in 1689 he was nominated to fill the vacant see of Chichester. He was next employed, with others of the episcopal bench, in settling the affairs of the church of Ireland; with which view, they sent back all the clergy who fled into England for refuge from the tyranny and persecution of the late reign. In the year 1691 the bishop was translated to the see of Ely, of which he proved himself a liberal benefactor, by the improvements which he introduced into its temporalities. At the same time he consecrated his labours to the interests of piety and virtue, by many valuable writings. He died at Ely in 1707, in the 81st year of his age. His works were numerous, but the most important are his "Commentaries" upon the historical books of the Old Testament, and "Paraphrases" on the books of Job, Psalms, Proverbs, Ecclesiastes, and Solomon's Songs. These were collected into three volumes, folio, and, with Lowth's "Commentaries" upon the Prophets, Arnald's upon the Apocrypha, and Whitby on the New Testament, form a complete collection, in high estimation. Biog. Brit. Toulmin's Neal.

PATRICK, in *Geography*, a county of Virginia, in America, containing 6682 free, and 647 black people.

PATRICK'S, St., a small island in the Irish sea, near the east coast of Ireland. N. lat. 53° 36'. W. long. 6° 5'.

PATRICK'S, St., a small town, the chief of Camden county, Georgia, situated on Great Satilla river, about 32 miles from its mouth.

PATRICK'S, St., *Purgatory*. See *Lough DERG*.

PATRICK, Order of St., is an institution which took place in Ireland in the year 1783. It was on the 5th day of February in this year, that his majesty ordered letters-patent to be passed under the great seal of the kingdom of Ireland, for creating a society or brotherhood, to be called knights of the illustrious order of St. Patrick; of which his majesty, his heirs, and successors, shall perpetually be sovereigns; and his majesty's lieutenant-general, and general-governor of Ireland, &c. for the time being, shall officiate as grand-masters; and also for appointing prince Edward, and several of the prime nobility of Ireland, knights-companions of the said illustrious order.

The badge of this order is a saltire red on a field azure, surrounded with a shamrock, or trefoil vert, charged with three imperial crowns or, within a garter, on which is the motto, *QUIS SEPARABIT*, "who shall separate them," **MDCCLXXXIII**. The whole is surrounded by a star of silver, with eight points; all which is embroidered, and worn on the outer garment of the knights of the order. The collar is of fine gold, composed of four harps and five roses, alternately joined or linked together by ten knots enamelled

white: the rose gules, surrounded by a border or, and enamelled azure. In the centre before is an imperial crown, to which is pendant an harp, and thereto the jewel of the order, being a cross saltire enamelled red, charged with a sky-blue enamelled tressil, surmounted with three imperial crowns of gold; the whole surrounded with a bordure of gold, on which the motto is enamelled blue. This jewel, except on public days, is worn pendant to a sky-blue ribbon, and ornamented with jewellery, agreeably to the will of the possessor.

This order is to consist of the sovereign, a grand master, a prince of the blood royal, and thirteen knights, making in the whole sixteen; and eight officers, *viz.* the prelate of the order, the chancellor, registrar, secretary, genealogist, usher of the black rod, Ulster king of arms, attendant on the order, and A'lhore pursuivant at arms. The lord lieutenant for the time being is the grand master. *New Ann. Register*, 1783. Debreit's Peerage.

PATRII DIU. See **DIU**.

PATRIMONIA, in *Geography*, a town of the island of Corsica; 4 miles W of Bastia.

PATRIMONIO, or *Patrimony of St. Peter*, a province of Italy, so called, as it is said, because it was granted by the emperor Constantine to support a church, which he had built in honour of St. Peter, and for the use of the pope. This country is bounded on the north by the Orvietan and part of Umbria, on the east by the Sabina and Campagna di Roma, on the south-west by the Mediterranean, and on the north-west by the duchy of Castro; about 43 miles long, and 32 broad. It is fertile in corn and fruit, and yields a considerable quantity of alum. The principal places in it are Viterbo, Monte Fiascone, Bolsena, Civita Castellana, and Civita Vecchia.

PATRIMONY, **PATRIMONIUM**, a right or estate, which a person inherits from his ancestors.

The name patrimony was also anciently given to the effects or revenues, with which a church or religious house was endowed. In which sense authors still say the patrimony of the church of Rimini, of Milan, &c.

The church of Rome, at the time of the fall of the Roman empire, acquired considerable territories, partly by purchase, and partly by the generosity of princes, &c. not only in Italy, but also in Sicily, and other remoter parts of Europe. These were called the patrimony of St. Peter, which were afterwards augmented by the benefactions of Pepin, king of France, who added the exarchate of Ravenna; and by Charlemagne, who gave to the pope several towns and provinces, which belong at this time to the estate of the church, over which the pontiff exercises sovereign authority.

To make what belonged to the churches the more respected, they usually gave their patrimonies the names of the saints they held in the highest veneration.

Thus the church of Ravenna called its inheritance the patrimony of St. Apollinaris; that of Milan the patrimony of St. Ambrose, as is observed by Fra. Paolo.

PATRINGTON, in *Geography*, is a small market-town and parish, in the south division of the wapentake of Holderness, and east riding of Yorkshire, England. The town is situated 18 miles S.S.E. from Kingston-upon-Hull, and 193 miles N. by E. from London. It is of great antiquity, and, according to Camden, was the ancient Prætorium of Antoninus; and with his opinion the best informed antiquaries coincide, as its distance from the neighbouring station of Delgovitia agrees with that mentioned in the Itinerary, whether we place the latter at Loudesbrough, or at Market-Weighton. The buildings of this town are much dispersed.

The

The parish church is a large and spacious edifice; its tower is surmounted by a lofty spire. The market is held here on Saturday weekly, and is much frequented by corn dealers. Here are, besides, three fairs during the year, principally for drapery, millinery goods, shoes, and other articles of dress. Patrington stands within less than a mile of the estuary of the Humber, which forms here a small creek, capable of affording shelter and anchorage to vessels of small burden. According to the parliamentary returns of 1811, the town and parish contain 190 houses, and a population of 1016 inhabitants.

About a mile and a half to the north-west of Patrington is the pleasant village of Winestead, which is adorned with two elegant villas, the seats of sir Robert d'Arcy Hildyard, bart., and of Henry Masters, esq. The seat of the former is denominated Winestead-hall, and both being seated upon gently rising ground, command a beautiful prospect of the town of Patrington, the Humber, and Sunk island. This island has its name from the circumstance of its having been entirely under water till the reign of Charles I., when it began to appear by the receding of the ocean. At first, only a few acres were left dry at low water; but as it increased in extent every year, it was at length embanked, and laid down as pasture land. Other embankments, however, were made at subsequent periods, in proportion as the waters retired; so that the island is now of considerable extent, and only separated from the Holderness marshes by a ditch a few feet in breadth. The last embankment was effected in 1808, and inclosed an area of 4570 acres. Sunk island is divided into several farms, and a church has lately been built upon it, for the accommodation of the inhabitants. The soil is peculiarly fertile.

Spurn-head, or Spurn-point, situated about ten miles to the south-east of Patrington, constitutes the extremity of the noted "Ocellum Promontorium" of Ptolemy, which projects nearly half-way across the entrance into the Humber. Its present name of Spurn-head is of Saxon origin; the verb "spurien," in that language, signifying to explore or spy out. A light house is placed here, as a guide to vessels navigating the estuary. Somewhere in this vicinity was anciently the celebrated sea-port Ravenspur, or Ravenfer, remarkable in the annals of England as the landing-place of Henry IV., A.D. 1399, and of Edward IV., A.D. 1471, when these princes came to contend for the possession of the English sceptre. This town has long since been swallowed up, either by the ocean, or by the Humber; so that the spot on which it stood is uncertain. Several other towns and villages hereabouts have experienced a similar fate. Among them are mentioned Frismerk, Tharlethorpe, Redmayr, Pennysmerk, Upsal, and Pottenfleet; all of which Dr. Gibson supposes were overflowed in the 30th or 38th year of Edward III., when the tides are recorded to have risen to a most extraordinary height. The inundation of Ravenspur, however, must have taken place at a much later period.

Near the village of Halsham, about three miles and a half beyond that of Winestead, is a superb mausoleum, erected by the late William Constable, esq., as a burying-place for that family. The architecture of this building displays an union of elegance and simplicity, which at once captivates the eye, and is appropriate to the nature of the structure. The position of this mausoleum is lofty, and the surrounding grounds are covered with trees. Beauties of England and Wales, vol. xvi. by John Bigland.

PATRINI and MATRINI, among the Romans, children whose father and mother were both living.

It was by a certain number of these that hymns were sung to supplicate the gods.

PATRIOT is a denomination given to a person who, under a free government, loves his country, and exerts all his power for promoting its glory and welfare. Whence patriotism is used to denote the love of one's country. Rome, Athens, and Lacedæmon, owed their existence and glory to patriotism, founded on noble principles, and supported by distinguishing virtues. But the most perfect patriotism is that which comprehends the rights of mankind in general. The author of the Spirit of Laws seems to have been actuated by sentiments of universal patriotism.

PATRIPASSIANS, PATRIPASSIANI, a name given to the Sabellians, because they did not believe it was the Son, but the Father himself that suffered and was crucified.

The council of Antioch, held by the Eusebians in 345, says, that those whom the Romans call Patripassians, the eastern people called Sabellians: it adds the reason of the name Patripassians in their condemnation; viz. that by the incarnation of the Father, they rendered him comprehensible and passible.

The Patripassian heresy was first broached by Praxeas, who was seconded by Victorinus, at the beginning of the third century. They confessed Christ to be God, and that God suffered and died for us; but they confounded the divine persons, and denied in effect the Trinity; meaning by Father, Son, and Spirit, not three persons, but one person under three names. So that he who suffered for us, was according to them as much Father as Son. Tertullian wrote expressly against Praxeas.

Hermogenes espoused the error of the Patripassians, whence they came to be denominated also Hermogenians. Afterwards Noetius gave into it, which occasioned them the name of Noetians. His disciple Sabellius the Libyan followed, about the year 250, whence they are called Sabellians. Lastly, because Sabellius was of Pentapolis, and the heresy spread much there, it was called the Pentapoltan doctrine.

PATRIS, *Dower ex Assensu*, in Law. See DOWER.

PATRIS, in Geography, a town of Hindoostan, in the circar of Aurungabad; six miles S.E. of Aurungabad.

PATRIZI, FRANCESCO, in Biography, a philosopher and man of letters, was born, in 1529, in the island of Cherfo, on the coast of Dalmatia, but he derived his origin from the family of Patrizi, in Sienna. He was educated at Padua under the most eminent masters of the time. In 1553 he began to appear as an author by some miscellaneous Italian tracts. In 1557, with the view of obtaining the patronage of the duke of Ferrara, he published a panegyric poem on the house of Este, entitled "L'Eridano," in a novel kind of heroic verse of thirteen syllables. After this, for several years, he passed an unsettled kind of life, in which he twice visited the isle of Cyprus, where he took up his abode for seven years, and which he finally quitted on its reduction by the Turks in 1571. He also travelled into France and Spain, and spent three years in the latter country, collecting a treasure of ancient Greek MSS. which he lost on his return to Italy. In 1578 he was invited to Ferrara by duke Alphonso II. to teach philosophy in the university of that city. Afterwards, upon the accession of Clement VIII. to the popedom, he was appointed public professor of the Platonic philosophy at Rome, an office which he held with high reputation till his death, in 1597. He was chiefly distinguished by his attainments in ancient philosophy. His work entitled "Discussiones Peripateticæ,"

pateticæ," is characterised as a learned and elegant performance. After having been a defender of the Aristotelian philosophy and its author, he became a violent oppugner of it, and undertook entirely to subvert it, in a second work entitled "Nova de Univerſis Philoſophia." In this he propoſes a new ſyſtem founded on the Platonic philoſophy, with ſuch additions and alterations as ſeemed requiſite. He is highly deſerving of praiſe as having been one of the firſt of the moderns who attentively obſerved the phenomena of nature, and he made uſe of every opportunity, that his travels afforded him, for collecting remarks concerning various points of aſtronomy, meteorology, and natural hiſtory. In one of his "Dialogues on Rhetoric," he advanced, under the ſiſtion of an Ethiopic tradition, a theory of the earth perfectly ſimilar to that afterwards propoſed by Dr. Thomas Burnet. His other principal works were "Nova Geometria," 1587; "Paralleli Militari," 1594, both of which are full of whimſical theories. Patrizi appeared likewiſe as a learned editor of "Oracula Zoroaſtris, Hermetis Trimegiſti, et aliorum ex ſcriptis Platonicorum collecta, Græce et Latine, prefixa Diſſertatione Hiſtorica." 1591. Moreri.

PATRO, in *Geography*, a town of France, in the department of Gola (iſland of Corſica) and chief place of a canton, in the diſtrict of Calvi. The canton contains 1455 inhabitants.

PATROCLUS, in *Biography*, a Grecian chief, ſignaliſed in the Trojan war, was the ſon of Menoetius, by Sthenela, who is named by ſome authors Philomela, or Polymela. The murder of Clyſonymus, the ſon of Amphidamus, by accident, in the time of his youth, obliged him to fly from Opus, where his father reigned. He went to the court of Peleus, king of Pythia, was very cordially received, and contracted the moſt intimate friendſhip with Achilles, the king's ſon. When the Greeks went to the Trojan war, Patroclus went with them at the expreſs deſire of his father, who had viſited the court of Peleus, and he accordingly embarked with ten ſhips from Pythia. He was the conſtant companion of Achilles; lodged in the ſame tent; and when he reſuſed to appear in the field of battle, becauſe he had been offended by Agamemnon, Patroclus imitated his example, and by his abſence was the cauſe of much evil to the Greeks. At length, however, Neſtor prevailed upon him to return to the war, and Achilles permitted him to appear in his armour. The bravery of Patroclus, together with the terror which the ſight of the arms of Achilles inſpired, ſoon routed the victorious armies of the Trojans, and obliged them to fly to the city for ſafety. He would have broken down the walls, but Apollo, who intereſted himſelf for the Trojans, oppoſed him, and Hector, at the inſtigation of that god, diſmounted from the chariot to attack him as he attempted to ſtrip one of the Trojans whom he had ſlain. This engagement was obſtinate, but Patroclus was at length overpowered by the valour of Hector, and the interpoſition of Apollo. His arms became the property of the conqueror, and Hector would have beheaded him, had not Ajax and Menelaus prevented it. His body was at laſt recovered, and carried to the Grecian camp, where Achilles received it with the loudeſt lamentations. His funeral obſequies were obſerved with the greateſt ſolemnity. Achilles ſacrificed near the burning pile twelve young Trojans, four of his horſes, and two of his dogs; and the whole was concluded by the exhibition of funeral games, in which the conquerors were liberally rewarded by Achilles. The death of Patroclus gave riſe to new events. Achilles forgot his reſentment againſt Agamemnon, left the field to

avenge the fall of his friend; and his anger was affuaged only by the ſlaughter of Hector, who had more powerfully kindled his wrath by appearing at the head of the Trojan armies in the armour which had been taken from the body of Patroclus.

PATROL, or PATROUTLE, anciently *Patoul*, in *War*, a round, or march made by the guards, or watch in the night-time, from the beating of the tattoo till the reveille, to obſerve what paſſes in the ſtreets, and to ſecure the peace and tranquillity of a city or camp.

The patrol conſiſts generally of a body of ſix or twelve men, detached from a *corps de guard*, and commanded by a ſerjeant.

When the enemy is near at hand, patrols conſiſt of an officer and thirty or forty men, as well infantry as cavalry.

PATRON, PATRONUS, a term uſed in various acceptations, though all reducible to the relation of a protector, or guardian.

In the church of Rome, a ſaint, whoſe name a perſon bears, or under whoſe protection he is put, and whom he takes particular care to invoke; or a ſaint in whoſe name a church or order is founded; or a perſon who firſt eſta-bliſhed it, and who is choſen protector of it; are called the patrons thereof. Thus, St. Peter and St. Paul are the patrons of the church of St. Genevieve, St. Dionyſius the patron of the city of Paris, St. George of England, St. Benedict the patron of the Benedictines, St. Michael of the armourers, St. Ignatius of the Jeſuits, &c.

PATRON, *Patronus*, among the Romans, was an appellation given to a maſter who had freed his ſlave.

Hence, as the right and relation of maſter expired, that of patron commenced.

For the Romans, in giving their ſlaves their freedom, did not deſpoil themſelves of all rights and privileges in them; the law ſtill ſubjected the freed-men to conſiderable ſervices and devoirs toward their patrons, the neglect of which was always very ſeverely puniſhed.

The principal right, which patrons had, was that of being the legal heirs of their freedmen, if they died without lawful iſſue, born after their enfranchiſement, and in teſtate.

By the Papien law it was farther provided, that if the eſtate of the freed-man were one hundred thouſand ſeſterces, and he had three children, the patron ſhould have a child's portion.

PATRON was alſo a name, which the people of Rome gave to a perſon of power, under whoſe protection they put themſelves.

The common people uſually choſe ſome perſon of eminence and authority, to whom they paid all kind of honour and reſpect; denominating themſelves his clients: and the patron on his ſide granted them his credit and protection.

By this reciprocal relation was the patron bound to his client, and the client to his patron.

Hence the appellation of patroni was given to thoſe lawyers, who defended the cauſe of their clients in matters of law, in contradiſtinction to the *procuratores*: they were called *advocati*. See *ADVOCATE*.

PATRON, in the *Canon and Common Law*, denotes a perſon who founds or endows a church or benefice, and reſerves to himſelf the right of patronage.

The king is patron paramount of all eccleſiaſtical benefices in England.

PATRON, in *Navigation*, is a name given in the Mediterranean to a perſon who commands the veſſel, and ſeamen; ſometimes

sometimes the person who steers it; the former, in other places, being called *master*; the second, *pilot*.

PATRONA, or **PADRON**, in *Geography*, a town of Syria, near the sea-coast, said to have been founded by Iobalus, contemporary and ally of Ahab, king of Israel; its ancient name was "Botrys" or "Botryum." Mr. Maundrell found in this place the remains of an old church and monastery, which, as well as the town, were in a state of ruin; 20 miles S.W. of Tripoli. N. lat. $44^{\circ} 12'$. E. long. $35^{\circ} 35'$.

PATRONAGE, **PATRONATUS**, the right of giving or disposing of a church or benefice, properly belonging to the founder or endower thereof. See **ADVOWSON**.

The right of patronage was introduced among Christians towards the close of the fourth century, with no other view than to encourage the opulent to erect a great number of churches, by giving them the privilege of appointing the ministers that were to officiate in them.

Patronage consists in having the nomination, or presentation to the benefice by him founded or endowed; in having the honourable rights of the church; in being interred in the chancel, &c.

Of patronages, some are *lay*, others *ecclesiastical*.

PATRONAGE, *Lay*, is a right attached to a person, either as founder, or as heir of the founder; or as possessor of a fee to which the patronage is annexed.

PATRONAGE, *Ecclesiastical*, is that which a person is intitled to by virtue of some benefice which he holds.

If an ecclesiastic have a right of patronage on his own account, independent of his ecclesiastical capacity; this is still *lay* patronage. *Lay* patronage, again, is *real* or *personal*.

PATRONAGE, *Real*, is that attached to the glebe, or to certain lands and hereditaments.

PATRONAGE, *Personal*, is that belonging immediately to the founder of the church, and transmissible to his children and family; without being annexed to any fee.

Personal patronage cannot be alienated or sold; real may, together with the glebe to which it is annexed. There must ever be some body or matter to fix to it, in order to its being transferred to another.

The origin of the right of patronage, we find in the tenth canon of the council of Orange: where it is expressed, that a founder may present to the diocesan the clerks he thinks proper for his church. And by a law of Justinian it is ordained, that the founders of churches may not put clerks in them on their own authority, but only present them to the bishop.

Some canonists look on the right of patronage, as a kind of ecclesiastical servitude. The right of patronage sleeps, but is not lost, while a person is out of the communion of the church.

PATRONAGE, *Disturbance of*, is an hindrance or obstruction of a patron to present his clerk to a benefice. Disturbers of a right of advowson may be the pseudo-patron by presenting to a church to which he has no right, and thereby making it litigious or disputable; his clerk, by demanding or obtaining institution; and the ordinary, by refusing to admit the real patron's clerk, or admitting the clerk of the pretender. These disturbances are vexatious and injurious to him who hath the right; and, therefore, the law (besides the writ of the right of advowson, which is a final and conclusive remedy) hath given him two inferior possessory actions for his relief; an *assise of darrein presentment*, and a writ of *quare impedit*, in which the patron is always the plaintiff, and not the clerk.

PATRONAGE, *Arms of*, in *Heraldry*, are those, at the top

of which are some marks of subjection and dependence. Thus the city of Paris bears three fleurs-de-lis in chief, to shew her subjection to the king.

The cardinals on the top of their arms bear those of the pope, who gave them the hat, to shew that they are his creatures. See **ARMS**.

PATRONYMIC, Πατρωνυμια, formed from πατήρ, *father*, and ονομα, *name*, among *Grammarians*, is applied to those names which the Greeks gave to the race, or lineage; and which were taken from him who was the founder thereof.

Thus the descendants of Æacus were called Æacidae; and those of Hercules, Heraclidae.

These patronymic names the Romans called *gentilitia*, which amount to much the same with our *surnames*.

Thus, those of the late reigning family in France, we call the Bourbons; those of the late in England, the Stuarts, &c.

PATROON GALLEY. See **GALLEY**.

PATROUILLE. See **PATROL**.

PATROURA, in *Geography*, a town of Hindoostan, in Boggilund; 25 miles S.E. of Makoonda.

PATRU, **OLIVER**, in *Biography*, a distinguished French writer, was born at Paris in 1664. He was intended by his father for the bar, and he cultivated with great assiduity the talent of writing and speaking with purity. He visited Rome, and on his return his reputation procured him admission into the French academy in 1640. At his reception he delivered an oration of thanks, which pleased that body so well, that it became thenceforth the rule for every new member to pronounce a similar harangue. Patru was connected with most of the eminent literary characters in France of that period, and was consulted as an oracle upon every question relative to language. Boileau, Racine, and other wits, read their works to him, and profited by his remarks. Racine, it is said, frequently shrunk from the severity of his animadversions, but Boileau was fully sensible of their value. Patru fell into a state of indigence, and Boileau purchased his library, and generously permitted him to retain it during his life. "That a poet," says his biographer, "should be the pecuniary benefactor of a celebrated pleader, seems contrary to the usual order of things; but Patru was probably more intent in polishing his style, than in turning over law-books and hunting for clients. He was a man of a philosophical spirit, generous, compassionate, and not depressed by the frowns of fortune. His opinions were sceptical, on which account he was visited by Bossuet in his last illness, for the purpose of exhorting him to edify the public by some demonstrations of religious conviction. It will more become me, said Patru, to be silent, for men in their last moments talk only through weakness or vanity." On his death-bed he had a visit from the minister Colbert, who brought him a donation of 500 crowns. He died in January 1681, in his 77th year. Patru is chiefly known as an author by his "Plaidoyers;" but he likewise wrote harangues, letters, and the lives of some friends, which have in a good measure lost their reputation. The best edition of his works is that of 1732, in two vols. 4to. Moreri.

PATSA, in *Geography*, a town of Hindoostan, in the circar of Surgooja; 25 miles N.E. of Surgooja.

PATSAAN, a small island on the E. side of the gulf of Bothnia. N. lat. $60^{\circ} 48'$. E. long. $20^{\circ} 58'$.

PATSCHKAU, a town of Silesia, in the principality of Neisse; 13 miles W. of Neisse. N. lat. $50^{\circ} 18'$. E. long. $16^{\circ} 50'$.

PATSHIKAMISTICK, a river of Canada, which runs into the Sable, N. lat. $49^{\circ} 45'$. W. long. $72^{\circ} 36'$.

PATTA,

PATTA, or **PATI**, an island in the Indian sea, near the coast of Africa, about 10 miles in circumference; chiefly inhabited by Arabians, with whom the English, Portuguese, and Indians trade for ivory and slaves; it is situated near the coast, at the mouth of a river of the same name. S. lat. $1^{\circ} 56'$. E. long. $43^{\circ} 20'$.

PATTALA, in *Ancient Geography*, a town of India, that has been commonly referred to the Delta of the Indus. Alexander arrived at this place about the middle of August. 326 years B.C., and having made proper arrangements for the safety and convenience of his fleet and army, and having viewed also the two principal mouths of the Indus, on which he experienced some degree of surprize, if not of terror, from the "bore," or sudden influx of the tide, he departed by land for Susa, leaving Nearchus with the fleet to follow as soon as the Etesian winds should cease. Nearchus failed in October with the N.E. monsoon, conducting, according to Dr. Gillies, in his elegant History of Greece, "the first European fleet which navigated the Indian seas." Pattala is supposed to have been the site of the modern city of *Tatta*, which see. According to a tradition among the people of Sindy, Pattala stood in the superior delta, whereas Patta is placed in the inferior delta. Renneil's Memoir.

PATTALIA, in *Natural History*, a word used by Aristotle and the rest of the old Greek writers, to express a stag or deer of two years old.

PATTALLY, in *Geography*, a town of Hindoostan, in Bahar; 33 miles E.N.E. of Hajypour.

PATTAN, **LELIT**, a city of Asia, in Nepal or Napaul, the capital of an independent kingdom, S.W. of Cat'h-manda or Cat'manda; containing near 24,000 houses: the southern boundary of this kingdom is at the distance of four days' journey, bordering on the kingdom of Macwanpur. N. lat. $28^{\circ} 5'$. E. long. $85^{\circ} 10'$.

PATTAN, a town of Hindoostan, in Mewat; 16 miles S.W. of Cotputly.—Also, a town of Hindoostan, in Vilia-pour; 20 miles N.W. of Sattarah.

PATTANCHERU, a town of Hindoostan, in Gbl-conda; 20 miles W.N.W. of Hydrabad.

PATTAPOOW-WINEPEE, a lake of North America. N. lat. $54^{\circ} 50'$. W. long. 96° .

PATTEERAH, a river of Thibet, which runs into the Ganges, on the borders of Hindoostan.

PATTELBACHEES, one of the smallest Molucca islands. N. lat. $0^{\circ} 3'$. E. long. $127^{\circ} 21'$.

PATTEN-SHOE, in the management of horses' feet, is a term applied to that sort of shoe which has a kind of half ball of iron welded to it underneath, which is hollow within. It is intended for the use of such horses as are lame in the hip, being put upon the sound foot, in order that the animal, by not being able to stand upon that foot without pain, may be under the necessity of supporting itself upon the lame foot, and in that way contract the disposition in the sinews to contract or draw up the haunch. It is the method of practice with some, where horses are newly lamed in the shoulders, either to peg the other foot, or set on a patten-shoe, in the view of bringing the lame shoulder upon the stretch; but with others it is the custom to immediately turn them out to graze; both of which some think very exceptionable modes of proceeding, and the most ready ways of rendering them incurably lame; the patten-shoe being simply necessary in long standing lamenesses, where the tendons of the muscles have been a long while contracted or drawn up.

PATTEN'S Creek, in *Geography*, a river of America, in Kentucky, which runs into the Ohio, N. lat. $38^{\circ} 22'$. W. long. $85^{\circ} 50'$.

PATTENSBURG, a small town of America, in

Botetourt county, Virginia, situated upon James' river; 26 miles from Lexington.

PATTENSEN, a town of Westphalia, in the principality of Calenberg, formerly encompassed with walls, moats, and ramparts; 6 miles S. of Hanover.

PATTERGAUT, a town of Hindoostan, in the Subah of Delhi; 20 miles W. of Coel.

PATTERGOTTA, a town of Hindoostan, in Bengal; 10 miles E. of Pucculoe.—Also, a town of Assam; 15 miles E. of Gentiah.—Also, a town of Bengal; 22 miles S.W. of Dinagepour.—Also, a town of Bengal; 18 miles E. of Boglipour.

PATTERGUR, a town of Hindoostan, in the circar of Sambal; 4 miles N.E. of Nidjibabad.

PATTERPURRA, a town of Bengal; 47 miles S.W. of Burdwan.

PATTERRA, a town of Bengal; 5 miles E. of Midnapour.

PATTERSON, a town of America, in Bergen county, New Jersey, established in consequence of an act of the legislature of New Jersey in 1791, incorporating a manufacturing company with peculiar privileges. Its situation on the Great Falls of Passaic river is healthy and agreeable. It contains about 50 dwelling houses, besides the buildings appropriate to the manufactures of all kinds, which it was proposed to carry on in this place, the most convenient for the purpose of any on the continent; but they did not succeed to the degree that was expected; 19 miles N.E. of Morristown. N. lat. $40^{\circ} 12'$. W. long. $74^{\circ} 57'$.

PATTERSOOT, a town of Prussia, in the circle of Natangen; 6 miles S.W. of Brandenburg.

PATTERWALDT, a town of Prussia, in the circle of Natangen; 24 miles E.S.E. of Königberg.

PATTES, in *Heraldry*, the paws of a beast. See **PAW**.

PATTI, **PATI**, or **Piatti**, in *Geography*, a sea-port town of Sicily, in the valley of Demona, situated on the N. coast, in a bay or gulf to which it gives name, built on the ruins of Tindaro, by count Roger, after he had vanquished the Saracens: the see of a bishop suffragan of Messina; 32 miles W. of Messina. N. lat. $38^{\circ} 10'$. E. long. $15^{\circ} 2'$.—Also, a river of Sicily, which runs into the sea, one mile E. of Patti.

PATTIAD, a town of Hindoostan, in Guzerat; 35 miles N.W. of Gogo.

PATTIARY, a town of Hindoostan, in Oude; 55 miles E.N.E. of Agra. N. lat. $27^{\circ} 35'$. E. long. $79^{\circ} 26'$.

PATTICAUT, a town of Hindoostan, in Cochin; 38 miles E.N.E. of Cranganore.

PATTIGAM, a town of Hindoostan, in Orissa; 30 miles N. of Orissa.

PATTMES, a town of Bavaria; 8 miles N. of Aicha.

PATTSCHOW, or **PATZOW**, a town of Bohemia, in the circle of Bechin; 38 miles S. of Prague. N. lat. $49^{\circ} 30'$. E. long. $14^{\circ} 50'$.

PATTUNGAM, a town of Hindoostan, in Orissa; 18 miles N. of Sonnepour.

PATTYAH, a town of Hindoostan, in Oude; 22 miles S.S.W. of Canoge.

PATTYPOUR, a town of Hindoostan, in Bahar; 52 miles S.S.W. of Patna.

PATUCKET, a small village of America, about four miles N.E. of Providence in Rhode island, a place of considerable trade and manufactures. Through this village runs Patucket or Pawtucket river, which empties into Seekhonk river at this place. The river Patucket, called in its more northerly course Blackstone's river, has a beautiful fall of water,

water, directly over which has been built a bridge on the line, which divides the commonwealth of Massachusetts from the state of Rhode island; distant about 40 miles S. by W. from Boston.

PATURAGES, a town of France, in the department of Jemmapes, and chief place of a canton, in the district of Mons. The place contains 3208, and the canton 14,126 inhabitants, on a territory of 117½ kilometres, in 17 communes.

PATUXENT, or **PATUXET**, a navigable river of America, in Maryland, which rises near the source of Patapsco river, and runs into the W. side of Chesapeake bay, between Drum and Hog island points; 15 or 20 miles N. of the mouth of the Patowmack. It admits vessels of 250 tons to Nottingham, nearly 46 miles from its mouth, and of boats to Queen Anne, 12 miles higher.

PATZLAWITZ, a town of Moravia, in the circle of Olmutz; 18 miles S. of Olmutz.

PAU, a town of France, and chief place of a district, in the department of the Lower Pyrenées; situated on a river called the "Gave of Pau." It is divided into the East and West parts: the former contains 5800, and its canton 9708 inhabitants, on a territory of 52½ kilometres, in 10 communes; and the latter 2785, and its canton 12,593 inhabitants, on a territory of 122½ kilometres, in 11 communes. It was, before the revolution, the capital of Bearn, and the seat of a parliament, a governor, a seneschal, &c. and contained an university, an academy of sciences, two hospitals, a college, and several convents. This place has manufactures, linen, &c. and its hams are highly esteemed. The environs are planted with vineyards. N. lat. 43° 17'. W. long. 0° 18'.

PAU, *St.* a town of Spain, in the province of Catalonia; 12 miles N.W. of Gerona.

PAVAGE, **PAVAGIUM**, in our old *Law Books*, money paid towards the paving of streets, or highways.

PAVAIS, **PAVACHE**, or *Tallevas*, in *Ancient Armour*, was a large shield, or rather a portable mantlet, capable of covering a man from head to foot, and probably of sufficient thickness to resist the missile weapons then in use. These were, in sieges, carried by servants whose business it was to cover their masters with them, whilst they with their bows and arrows shot at the enemy on the ramparts. In the list of the army that accompanied king Edward III. to Calais, we find many "Pavifors:" these were probably men trained to the use of the pavais, which must have required dexterity as well as courage. Pavaches were sometimes supported by props: they were also used at sea to defend the sides of the vessels, like the present netting of our ships of war: this defence was called a "pavifade," and may be seen in the representation of ancient ships. The pavais was rectangular at top, the sides being consequently parallel, but the angle is rounded off at the bottom. Under the protection of the pavaches, workmen also approached to the foot of the wall in order to sap it.

PAVAKA, in *Mythology*, is the Hindoo regent of fire, and is a deity frequently invoked in the variety of sacrificial ceremonies observed by that superstitious race. The element of fire being of such vital importance in all the operations of nature, and in its evident and hidden phenomena so striking and mysterious, it has, of course, excited the wonder and invited the research of the vulgar and the wise of all ages and nations. The sun, the supposed source of heat, is naturally joined with his offspring in the awe and adoration with which each is contemplated; and among the Hindoos, as with other polytheists, we find the attributes and characters of the regents of light and heat

often coalescing. The Hindoos have, however, depicted their fire-king in colours and forms not common to others. He is painted of a deep red; with two faces, three legs, and seven arms, riding on a ram, and bearing a flag with that animal on its field. Few, if any, of the numerous ceremonies of the Brahmans are complete without invocatory oblations to the all-pervading element of fire, or to its personification, under the name of Pavaka or Agni; the latter is indeed his most popular and common name. In sacrificial ceremonies, as ordained by Menu (see MENU), Agni is generally the deity primarily invoked. A Brahman is directed in his domestic fire for dressing the food that he daily offers to the gods, to make an oblation, "First, to Agni, god of fire, and to the lunar god, severally; then to both of them at once." (C. iii. v. 85.) Again, in offering to the *Dii Manes*: "The divine manes are always pleased with an oblation in empty glasses, naturally clean, on the banks of rivers, and in solitary spots. First, as it is ordained, having satisfied Agni, Soma, and Yama, with clarified butter, let him proceed to satisfy the manes of his progenitors." Ib. c. iii. v. 207. 211.

The Brahmans subdivide the igneous element, first, into two, the solar and terrestrial; or creative and destructive fire. Here Agni, as its general personification, coalesces with Brahma and Siva, and hence it has been furnished his two faces. Terrestrial fire is again subdivided into three, *viz.* the nuptial, the ceremonial or funeral, and the sacrificial. Agni's three feet may allude to these, or to the influence of fire over the three regions of the universe. The sun is preceded by a seven-headed horse, or by seven horses yoked to his car; allusive, it is supposed, to the prismatic variety of a ray of light; and fire, like the sun, is supposed by the Hindoo philosophers to emit seven rays. This number is mysteriously repeated in invocations to Agni and Surya, the latter their Phœbus or Apollo. (See SURYA.) Hence the number of arms bestowed on Agni.

The following verses from Menu are illustrative of the attributes of Agni connected with the sacred triad of fires.

Ch. xi. v. 229. "Due reverence to these three (the parents and preceptor) is considered as the highest devotion; and without their approbation, no man must perform any other duty.

230. "Since they alone are held equal to the three worlds; they alone, to the three principal orders; they alone, to the three vedas; they alone, to the three fires.

231. "The natural father is considered as the *garbapatra*, or nuptial fire; the mother, as the *dakṣiṇa*, or ceremonial; the spiritual guide, as the *ahavaniya*, or sacrificial: this triad of fires is most venerable.

232. "By honouring his mother, he gains this terrestrial world; by honouring his father, the intermediate, or ethereal; and by assiduous attention to his preceptor, even the celestial world of Brahma."

Like other Hindoo deities, Agni has a wife or *fakti*, of whom some mention is made under the article SWAHA, who appears to have been a form of *Lakṣmi*. (See that article.) In one of the tales of the Puranas, it is related how "Lakṣmi performed tapasya for 100,000 years, in the flower of the padma or lotos, standing on one foot, (see PADMA and TAPAS), in order to obtain Viṣṇu. She then saw Sri Krishna or Viṣṇu, who said, 'Thou shalt be my wife when I assume the shape of Varaha; but in the mean time be the *fakti* of Agni, which *fakti*, or energy, burns every thing: be also the wife of Siva. Vahni, Agni, or Fire, for an hundred years of the gods, will have no other wish but to please thee.' She conceived by him: the gestation lasted twelve years, and three beautiful sons were born unto

unto her ; Dakshinagni, Garhapatya, and Ahavanya, three sacred fires." (Af. Ref. vol. xi. art. 2.) In this manner the theogonical legends of the Puranas run into each other ; very confusedly as would seem on partial examination, but connectedly, as it is said, will appear whenever that mass of romantic fables shall have been competently inspected. See PURANA.

The number seven, we have seen, is that of the arms of Agni, and of many allusions to him in his form of fire. In the ceremony called *vishvadeva*, a comprehensive one to *all the gods*, which is the meaning of the word, including the essentials of the whole detail of daily sacrifice, and practised therefore chiefly by Brahmans not exclusively engaged in the priesthood, the mystical number frequently occurs in this invocation ; for instance, to Agni. " Fire ! seven are thy fuels ; seven thy tongues ; seven thy holy fages ; seven thy beloved abodes ; seven ways do seven sacrifices worship thee ; thy sources are seven ; may this oblation be efficacious." An explanation of this mysterious passage is given by Mr. Colebrooke, in his " Essay on the Religious Ceremonies of the Hindoos," in the seventh volume of the Af. Ref.

We have noticed three of the sons of Agni or Pavaka, in the three sacred fires, by Lakshmi, in her form of his fakti. He had three other sons, perhaps by a different wife, named Uttama, Tamasa, and Riavata, whose names occur in the list of seven Menus, or sages, under the article MENU. Their names have probably some allusions, direct or inverse, to fire, or heat, or light. By another wife he had nine sons. Another son is noticed in the form of an ape under the article NILA. He had also seven brothers, whose names are varied significations of *flame*.

The three sons of Agni above named, are on other occasions called sons of Brahma, as mentioned under the article MENU, above referred to. Between Agni or Brahma we see here some identity : both are also painted red. It is in reference to his creative heat that he is connected with Brahma. He is also called Vahni, a name likewise of Saraswati, the consort of Brahma. A passage above quoted has shewn that the spouse of Agni coalesces with those of the other two persons of the Hindoo head : as doth Agni : his igneous property concentrated, connects him with the destructive Siva, who is also fire ; and his light, so intimately related to fire, with Vishnu the conservator. This triple connection between the deity of heat and the three great powers, is similar to what is remarked of the sun under the article SURYA.

Sir W. Jones, in his " Dissertation on the Gods of Greece, Italy, and India," has the following passage, applicable to the subject of our present article.

" The worship of solar or vestal fire may be ascribed, like that of Osiris and Isis, to the second source of mythology, or an enthusiastic admiration of nature's wonderful powers ; and it seems, as far as I can yet understand the Vedas, to be the principal worship recommended in them. We have seen that Mahadeva himself is personified by fire ; but subordinate to him is the god Agni, often called Pavaka, or the Purifier, who answers to the Vulcan of Egypt, where he was a deity of high rank ; and Agni's wife, Swaha, resembles the younger Vesta, or Vesta, as the Æolians pronounced the Greek word for a *heart*. Bhavani, or Venus, is the consort of the supreme destructive and generative power ; but the Greeks and Romans, whose systems are less regular than that of the Indians, married her to their divine artill, whom they also named Hephaistos, or Vulcan, and who seems to be the Indian Vishwakarma, the forger of arms for the gods, and inventor of the

Agniaster, or fiery shaft, in the war between them and the Daityas, or Tritons." Vol. i. art. 9.

We thus find that the Indian Venus, like her of the Greeks and Romans, is the consort of the fiery god, both as Lakshmi and Bhavani, or Parvati : for in a former extract from a Purana it was shewn that Lakshmi was bestowed on Agni by Vishnu, and became his fakti, or energy, and mother of his fiery triple offspring, and also was bade to become the wife of Siva.

With the Hindoos, purification is resorted to in divers modes, according to the nature of the sin ; and fire is the most efficacious. Hence the name Pavaka means the Purifier. Under the article KARSUAGNI an instance is given of its efficacy in the case of great enormity, and under SATI something farther will be found on that point. Under KARTIKYA and KRITIKA some Puranic fables are noticed, in which Agni bore a part.

To this deity a portion of the Vedas is ascribed, as having been revealed or promulgated by him. (See VEDA.) Seven books of the Yajurveda he is the reputed author of : and one of the Puranas, which details his history, is called the Agni Purani. See an outline of its contents under PURANA. He is therein also named Agnidhra, Anala, and Jivani : to the latter appellation it is added, " he, who does good to all ; from whom sprung the Vedas." Under the article MARUT it is noticed, that the Hindoos have guardians over the cardinal and intermediate points of the heavens. Among these is Pavaka ; and he rules or governs the south-east. In the Gita, when Krishna describes his own pre-eminence among all things and creatures, he says to Arjun, " Among the Vasus, I am Pavaka." See KRISHNA and VASU.

Among the offspring of Agni may be noticed the commander of the celestial armies, named Kartikya, who is hence called Agniya, and Agnihuva ; but he is more commonly reputed the son of Siva ; the instrumentality of the god of fire having been apparently confined to warming or inflaming the frigidty of Siva to a due pitch ; the charms of his consort Parvati appearing, by the Puranic fables, to have been unequal to that effect ; and a warlike son, being at the then critical period, essential to the safety of the gods. This fiery parentage of *Kartikya* is noticed under that article, and under MUNI : in the latter, the following correction is necessary ; second column, third line from the bottom, instead of many-mothered for, read many-mothered son.

PAVAN, PAVANA, the air of an ancient stately dance, which has been long out of use. It had its name from the dancer's assuming the dignity of the peacock ; or, perhaps, from Pavana, an Indian author of a system of music that goes under his name. In all sets of lessons for the virginal, from the time of queen Elizabeth to the reign of Charles I., there was a Pavan, which served as an adagio, or slow movement to the galard, as the saraband did afterwards to the courant.

PAVANA, in *Mythology*, is the Hindoo regent of the winds, and of the north-west quarter of the heavens ; the Hindoos having, as noticed under the article MARUT, a separate ruler or guardian for each cardinal and intermediate point. The name of this deity is usually pronounced Pavan ; and we may herein recognize the Faun-us of ancient Italy ; a contraction of Favon-ius, the north-west wind of the Mediterranean mythology, derived probably from a faun or antelope, apt emblem of its celerity, and allotted, therefore, in India, as a vehicle for Pavana, who, in pictures, usually appears so mounted. The Puranas contain particular directions to artists in respect to their delineating the gods.

In the Matsya Purana, the following point out the attributes of the one in question. "Let Pavana be painted young, clothed in robes of many colours, mounted on a fleet antelope, and with a standard in his hand, which the wind waves behind him as he cleaves the air." A farther instance of analogy in the European and Indian mythological tales, and connected with this article, will be found under MARUTY, a name of Hanuman, a simian hero, reputed son of Pavana, one of whose names is *Marut*, which see; a word, like Pavan, meaning the wind. He is lord or chief of the maruts, or winds. Vayu is another of his names, and Anila and Yahi. This deity is honoured by frequent invocation and sacrifice in the Brahmanical ceremonies. An instance is given under NIRRIITI. One of the Puranas is named after this deity, and feigned to have been promulgated by him; but as the found of Pavana immediately preceding *purana*, would be harsh in the fastidious ear of the Brahmans, that poetical sect, to avoid this cacophony, always call it after another of the names of the windy regent Vayupurana. See PURANA.

PAVANA, in *Botany*, the name of the plant which produces the grana tiglia of the shops. It is a species of ricinus.

PAVANA-Wood, when fresh, operates very violently, both by vomit and stool: when dried, it is much more gentle, never vomiting at all; but at present it is scarcely heard of in the shops.

PAUCARA, in *Geography*, a town of Peru, in the diocese of Guimanga; 20 miles E. of Guanca Velica.

PAUCARCOTTA, a town of Peru, which gives name to a jurisdiction, in the diocese of La Paz; 32 miles N. of Puno, which is the capital of the jurisdiction. This jurisdiction borders S. on that of Chucuito, and has the same temperature; and is therefore obliged to recur to other provinces for the greatest part of its grain, and esculent vegetables; but abounds in all kinds of cattle, both of the European and American kinds. The Indians of the town weave bags with their wool, and sell them to great advantage. The mountains in this province contain several silver mines, and among the rest the famous Layacota, in which the metal was often cut out of the mine with a chissel; but its prodigious richness accelerated the death of its owner, Joseph Salcedo; soon after which the waters broke into it, nor have any labour and expence been sufficient for draining it, so that it has been abandoned. Few of the other mines are wrought.

PAUCARTAMBO, a jurisdiction of Peru, in the diocese of Cusco, which commences eight leagues E. of Cusco, and is of considerable extent. In the time of the Incas it produced the greatest quantity of cocoa, with which it carried on a very profitable commerce. But since this shrub has been planted in other provinces, it has greatly declined. The soil is equally fertile in other productions.—Also, a river, that rises about 50 miles S.W. of Cusco, and after a northerly course of about 200 miles, through the jurisdiction to which it gives name, joins the Maranon at 10° 45'; but in fact it is the river styled by La Cruz Ynambari.

PAUCTON, ALEXIS, in *Biography*, a mathematician, was born near Laffay, in Mayenne, in 1732. He received his education in the mathematical and naval academy at Nantes, after which he went to Paris, where his integrity and talents obtained for him a considerable share of patronage. He died in the year 1799. His works are; 1. "Theory of the Force of Archimedes." 2. "A Treatise on the Weights, Measures, and Monies of all Countries, ancient and modern." 3. "Theory of the Laws of Nature, with a Dissertation on the Pyramids of Egypt."

PAVEMENT, a layer or stratum of stone, or other matter, serving to cover and strengthen the ground of divers

places, for the more commodious walking on, or for the passage of carriages.

The word is formed from the Latin *pavimentum*, of *pavire*, to beat down the earth, in order to make it firm and strong.

In England, the pavements of the grand streets, &c. are usually of flint or rubble-stone; courts, stables, kitchens, halls, churches, &c. are paved with tiles, bricks, flags, or fire-stone; sometimes with a kind of free-stone, and rag-stone.

In some cities, *e. gr.* of Venice, the streets, &c. are paved with brick; churches sometimes are paved with marble, and sometimes with mosaic work, as the church of St. Mark, at Venice. In France, the public roads, streets, courts, &c. are paved with gres or grit, a kind of free-stone.

In Amsterdam, and the chief cities of Holland, they call their brick pavement the *burgher-master's* pavement, to distinguish it from the stone or flint pavement, which usually takes up the middle of the street, and which serves for carriages; the brick which borders it being destined for the passage of people on-foot.

Pavements of free-stone, flint, and flags, in streets, &c. are laid dry, *i. e.* in a bed of sand; those of courts, stables, ground-rooms, &c. are laid in a mortar of lime and sand; or in lime and cement, especially if there be vaults or cellars underneath. Some masons, after laying a floor dry, especially of brick, spread a thin mortar over it; sweeping it backwards and forwards to fill up the joints. The several kinds of pavement are as various as the materials of which they are composed, and whence they derive the name by which they are distinguished: as, 1. *Pebble-paving*, which is done with stones collected from the sea-beach, mostly brought from the islands of Guernsey and Jersey; they are very durable, indeed the most so of any stone used for this purpose. They are used of various sizes, but those which are from six to nine inches deep, are esteemed the most serviceable. When they are about three inches deep they are denominated bolders, or bowlers; these are used for paving court-yards, and other places not accustomed to receive carriages with heavy weights; when laid in geometrical figures they have a very pleasing appearance.

2. *Rag paving*, was formerly much used in London, but is very inferior to the pebbles; it is dug in the vicinity of Maidstone, in Kent, from whence it has the name of Kentish rag-stone; there are squared stones of this material for paving coach-tracks and footways.

3. *Purbeck pitchens*; squared stones used in footways; they are brought from the island of Purbeck, and also frequently used in court-yards; they are in general from six to ten inches square, and about five inches deep.

4. *Squared paving*, for distinction by some called *Scotch paving*, because the first of the kind paved in the manner that has been and continues to be paved, came from Scotland; the first was a clear close stone, called blue wynn, which is now disused, because it has been found inferior to others since introduced in the order they are hereafter placed.

5. *Granite*, a hard material, brought also from Scotland, of a reddish colour, very superior to the blue wynn quarry.

6. *Guernsey*, which is the best, and now almost the only stone in use; it is the same stone with the pebble before spoken of, but broken with iron hammers, and squared to any dimensions required of a prismoidal figure, set with its smallest base downwards. The whole of the foregoing paving should be bedded and paved in small gravel.

7. *Purbeck paving*, for footways, is in general got in large surfaces, about two inches and a half thick; the blue sort is the hardest and the best of this kind of paving.

8. *Yorkshire paving*, is an exceeding good material for the same purpose, and is got of almost any dimensions of the same thickness of the Purbeck; this stone will not admit the wet to pass through it, nor is it affected by the frost.

9. *Ryegate, or fire-stone paving*, is used for hearths, stoves, ovens, and such places as are liable to great heat, which does not affect this stone, if kept dry.

10. *Newcastle flags*, are stones about two feet square, and one and a half, or two inches thick; they answer very well for paving out-offices; they are somewhat like the Yorkshire.

11. *Portland paving*, with stone from the island of Portland; this is sometimes ornamented with black marble dots.

12. *Sweedland paving*, is a black slate dug in Leicestershire, and looks well for paving halls, or in parti-coloured paving.

13. *Marble paving*, is mostly variegated with different marbles, sometimes inlaid in mosaic.

14. *Flat brick paving*, done with brick laid in sand, mortar, or grout, as when liquid lime is poured into the joints.

15. *Brick on edge paving*, done with brick laid edgewise in the same manner.

16. Bricks are also laid flat or edgewise in herring-bone.

17. Bricks are also sometimes set endways in sand, mortar, or grout.

18. Paving is also performed with paving bricks.

19. With ten-inch tiles.

20. With foot-tiles.

21. With clinkers for stables and out-offices.

22. With the bones of animals, for gardens, &c. And

23. We have knob-paving, with large gravel-stones for porticoes, garden-seats, &c.

Pavers' work is done by the square yard: and the content is found by multiplying the length by the breadth.

Pavements of churches, &c. frequently consist of stones of several colours; chiefly black and white, and of several forms, but chiefly square, and lozenges, artfully disposed. Indeed, there needs no great variety of colours to make a surprising diversity of figures and arrangements. M. Truchet, in the Memoirs of the French Academy, has shewn by the rules of combination, that two square stones, divided diagonally into two colours, may be joined together chequerwise sixty-four different ways: which appears surprising enough; since two letters, or figures, can only be combined two ways.

The reason is, that letters only change their situation with regard to the first and second; the top and bottom remaining the same: but in the arrangement of these stones, each admits of four several situations, in each of which the other square may be changed sixteen times, which gives sixty-four combinations.

Indeed, from a farther examination of these sixty-four combinations, he found there were only thirty-two different figures; each figure being repeated twice in the same situation, though in a different combination; so that the two only differed from each other by the transposition of the dark and light parts.

The paving of streets is one of the most beneficial regulations of police that have been transmitted to us from our ancestors. Several cities had paved streets before the commencement of the Christian era; nevertheless those which are at present the ornament of Europe, Rome excepted, were def-

titute of this great advantage till almost the 12th or 13th century. It is probable that those people who first carried on the greatest trade, were the first who paid attention to have good streets and highways, in order to facilitate that intercourse which is so necessary to keep up the spirit of commerce. Accordingly we are told by Isidorus (Origin. l. xv. c. 16.) that the Carthaginians had the first paved streets, and that their example was soon copied by the Romans. Long before that period, however, Semiramis paved highways, as appears by the vain-glorious inscription which she herself caused to be put up. (Strabo, l. xvi. Diod. Sicul. l. ii. v. 13. Polyæni Stratagem. l. viii. c. 26.) The streets of Thebes, and probably those of Jerusalem, were paved. But neither the streets of Rome, nor the roads around it, were paved during the time of its kings. In the year 188, after the abolition of the monarchical form of government, Appius Claudius, being then censor, constructed the first real highway, called after him the Appian way, and on account of its excellence, the queen of roads. The time when the streets were first paved cannot be precisely ascertained; some have referred this improvement to the year 578, after the building of the city; others to 584; and others to 459; at which several periods some parts of the city and suburbs might have been paved. That streets paved with lava, having deep ruts made by the wheels of carriages, and raised banks on each side, for the accommodation of foot-passengers, were found both at Herculaneum and Pompeii, is well known.

Of modern cities, the oldest pavement is commonly ascribed to that of Paris; but it is certain that Cordova in Spain was paved so early as the middle of the 9th century, or about the year 850. The capital of France was not paved in the 12th century, but the orders for this purpose were issued by the government in the year 1184, on which occasion it is said that the name of Lutetia, deduced from its dirtiness, was changed into that of Paris. Nevertheless, in the year 1641, the streets in many quarters of Paris were not paved. That the streets of London were not paved at the end of the 11th century, is asserted by all historians. It does not appear when paving was first introduced; but it was gradually extended as trade and opulence increased. Several of the principal streets, such as Holborn, which are at present in the middle of the city, were paved for the first time by royal command in the year 1417; others were paved under Henry VIII., some in the suburbs in 1544, others in 1571 and 1605, and the great market of Smithfield, in 1614.

PAVEMENT of *Terrace*, is that which serves for covering in manner of a platform; whether it be over a vault or a wooden floor.

Those over vaults are usually stones squared, and bedded in lead. Those on wood, called by the Latins *pavimenta con-signata*, are either stones with beds for bridges, tiles for ceiling of rooms, or lays of mortar made of cement and lime, with slints or bricks laid flat: as is still practised by the eastern and southern people a-top of their houses.

All those pavements which lie open were called by the Latins *pavimenta subdialia*.

PAVEMENT, *Mosaic*. See MOSAIC WORK.

PAVEMENT, *Tessellated*. See TESSELLATED.

PAVENTIA, in *Mythology*, the tutelary goddess of children. Among the Romans this goddess was invoked to avert from them frightful objects.

PAVETTA, in *Botany*, the Malabar name, retained by Rheede and adopted by Linnæus and others, contrary to rule, except as far as it is well-sounding. Linn. Gen. 54. Schreb. 71. Willd. Sp. Pl. v. 1. 610. Mart. Mill. Dict.

v. 3. Ait. Hort. Kew. ed. 2. v. 1. 244. Juff. 203. Gærtn. t. 25. Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Stellate*, Linn. *Rubiaceae*, Juff.

Gen. Ch. *Cal.* Perianth fuperior, very fmall, bell-shaped, four-toothed, crowning the germen, permanent. *Cor.* of one petal, funnel shaped; tube ufually long, flender, cylindrical; limb in four deep, lanceolate, fpreading fegments. *Stam.* Filaments four, very fhort, above the mouth of the corolla; anthers awl-shaped, fpreading, the length of the limb. *Pijl.* Germen inferior, roundifh; fyle thread-shaped, twice as long as the corolla; ftigma oblong, club-shaped, oblique. *Peric.* Berry roundifh, of two cells, one of them often abortive. *Seeds* folitary, roundifh, cartilaginous, convex on one fide.

Eff. Ch. Calyx bell-shaped, four-toothed, fuperior. Corolla of one petal; tube cylindrical; limb four-cleft, fpreading. Stamens rifing above the mouth. Style longer than the flamens. Stigma club-shaped, curved. Berry of two cells. Seeds folitary, cartilaginous.

Obf. We have already hinted the difficulty of eftablifhing a certain diftinftive character between this genus and *IXORA*; fee that article. Whether the greater length of the fyle, more entire ftigma, and lefs deeply divided calyx of *Pavetta* be of any great weight, a comparifon of all the fpecies of both genera together can alone determine.

1. *P. indica*. Linn. Sp. Pl. 160. Suppl. 121? Willd. n. 1. Ait. n. 1. (*P. feu* Malleamoth; Rheede Hort. Mal. v. 5. 19. t. 10.)—Leaves elliptic-lanceolate, fmooth, as well as the flower-ftalks. Calyx very flightly toothed. Style twice the length of the corolla. Found in many parts of the Malabar coaft, from whence Dr. Roxburgh fent us fpecimens. A humble fpreading ever-green fhrub. *Leaves* oppofite, ftalked, thin, fmooth and fhining, with many ftraight tranfverfe ribs. *Stipulas* broad, triangular, firmly combined with the foot-ftalks, quite fmooth. *Flowers* very numerous, white, fragrant, in fmooth, flender, repeatedly forked, cymofe panicles. Burmann's Ind. t. 13. f. 3, accords in no refpect with our plant. The plant of Rumphius, v. 4. t. 47, cited by Willdenow, after Linn. Mant. 331, is furely our *Ixora flammea*, and has neither the form nor colour of *Pavetta*.

2. *P. tomentofa*. Roxb. MSS.—Leaves elliptical, downy, as well as the flower-ftalks. Calyx cloven half way down. Style twice as long as the corolla.—Sent from India by Dr. Roxburgh, along with the former, from which it feems to differ chiefly in its broader leaves, which, like the *flower-ftalks* and *calyx* are downy, efpecially when young. The teeth of the *calyx* are much more conspicuous than in *P. indica*, and this character appears of confequence, from the confideration of other fpecies.

3. *P. villofa*. "Vahl. Symb. v. 3. 12." Willd. n. 2.—"Branches and calyx villous and hoary. Leaves lanceolate-elliptical. Flowers in tufts."—Native of Arabia Felix. We know nothing of this but from Willdenow. The *inflorefcence* is probably like *P. indica*, as Vahl ufes the fame term for both.

4. *P. longiflora*. "Vahl Symb. v. 3. 12." Willd. n. 3.—"Branches fmooth. Leaves lanceolate-elliptical. Stipulas hairy on the infide. Calyx four-cleft. Flowers in tufts."—Native of Arabia Felix, where it was gathered by Forkfall, as well as the laft. The *calyx* appears to be more deeply divided than in the firft fpecies, or perhaps the laft.

5. *P. caffra*. Linn. Suppl. 121. Thunb. Prodr. 29. Willd. n. 4. (*Criniva capensis*; Houttuyn Linn. Pfl. Syfl. v. 5. 357. t. 40. f. 1. *Willd.*)—Leaves obovate, fmooth. Flowers in terminal heads. Teeth of the calyx awl-shaped, above half the length of the tube of the corolla.—Gathered

by Sparrmann and Thunberg at the Cape of Good Hope. The length of the *calyx* is very remarkable, as well as the long white denfe hairs, clothing the common *receptacle*, or inner fide of the *bractees*. The *fyle* is twice as long as the *corolla*.

6. *P. barbata*. Leaves lanceolate-oblong, pointed, fmooth. Panicles forked, divaricated, fmooth. Tube of the corolla but half the length of the five-cleft limb, briftly at the mouth.—Gathered by the late Mr. Christopher Smith, at Honimoo, or Honimao, April 2, 1797. He fufpected it to be a *Pavetta*, and we can only prefume it to be fo. The whole appearance agrees with the figure of the next, and the *flowers*, as in that, are five-cleft; but their fhort tube diftinguifhes them from every other fpecies. The *anthers* are very long, equal to the *corolla*; nor does the *ftigma*, which is cylindrical and acute, though curved, project beyond them. The *calyx* is a little hairy, flightly toothed, decidedly bell-shaped. The *leaves* are coriaceous, a foot long, two inches broad, with taper points. *Panicles* axillary, many-flowered.

7. *P. pentandra*. Swartz Ind. Occ. 233. Willd. n. 5. (*Jafminum arborefcens*, folani foliis, baccis nigro-violaceis; Plum. Ic. 149. t. 156. f. 1. *Cerafo affinis* arbor baccifera racemofa, fructu cæruleo, monopireno, tellicuato; Sloane Jam. v. 2. 95. t. 202. f. 2.)—Leaves elliptic-lanceolate, pointed, fmooth. Panicles forked, divaricated, fmooth. Tube of the corolla twice as long as the five-cleft limb, naked at the mouth.—Native of uncultivated hills in Jamaica, where it is called Wild Coffee. The *leaves* appear to be broader, and lefs coriaceous, than in the laft. The *ftem* is the height of a man, or much more. *Flowers* white, highly fragrant, produced in the vernal months.

Swartz confiders the *SIDERODENDRUM* of Schreber, fee that article, akin to this plant, which he fays is, in a manner, intermediate between the three very clofely allied genera of *Pfychothria*, *Coffea* and *Pavetta*. We cannot help adverting to Willdenow's continuing the erroneous reference to Sloane, from Swartz's Prodrum, though he quotes the page in that author's Flora Ind. Occ., where the miltake is exprefly pointed out and rectified.

PAUGANARY, in *Geography*, a town of Hindooftan, in Marawar; 10 miles S. of Tripatore.

PAVIA, in *Botany*, fo called by Boerhaave in honour of Peter Pavius, who was profefor of Phyfic at Leyden, and to whom the care of the Botanic Garden there was confided in May 1592. The botanical Profeforship being conferred upon Clufius two months afterwards, Bontius and Pavius were affociated with him in this charge for feveral years. In 1609 the whole devolved upon Pavius, and he continued to enrich and improve the garden till his death in 1617. He does not appear to have publifhed any thing, not even a catalogue of the garden. The prefent plant is now referred by botanifts to another genus, fee *ÆSCULUS*, in which it bears the fpecific name of *Pavia*, and is well known in our gardens as the Scarlet Horfe-chefnut.

PAVIA, in *Geography*, a city of Italy, and capital of the department of the Teino, fituated on a beautiful plain, on the river Tefino. It was once the capital of Lombardy, but few evidences remain of its having been once thus diftinguifhed. The fortifications of the citadel have been neglected; the ftreets are broad and ftraight, and have fome good buildings. Pavia is the fee of a bifhop, and beides the cathedral, contains 18 parifh churches, and 38 convents. The univerfity was founded by Charlemagne, and re-eflablifhed by Charles IV. It is ftill in good repute, its profefors having diftinguifhed themfelves in natural hiftory, and is regarded as the firft in Italy. This city was founded by the Gauls; but they were expelled by the Romans, and the

Romans by the Goths, about the middle of the fifth century. In 476 or 477, Odoacer granted the inhabitants an exemption from taxes for five years, in order to enable them to rebuild the town, which had been ruined, and which till that time had been denominated Tifinum; and when it was rebuilt, it was called Papia or Pavia. In 568 it was taken by the Lombards, and became their capital; but this distinction terminated with Didier, who was taken prisoner by Charlemagne in the year 774, afterwards it became the prey of several tyrants, till it fell under the dominion of the dukes of Milan. After several disasters, this town was taken in 1800 by the French, who found in it immense stores belonging to the Austrians; 17 miles S. of Milan. N. lat. 45° 10'. E. long. 9 9'.

PAVIA, *Duchy of*, or the *Pavesi*, is now part of the department of the Tesino, and is bounded on the N. by the Milanese, on the E. by the Lodofan and Placentia, on the S. by the territory of Genoa, and on the W. by the Lumellin and Tortonese.

PAVICULA, among the Romans, a rammer, or instrument for beating down and levelling a spot of ground.

It consisted of a block of wood one foot long and half a foot thick, with a long handle.

PAVIGNANO, in *Geography*, a town of Italy, in the department of the Mela; 10 miles E.N.E. of Brescia.

PAVILION, in *Architecture*, signifies a kind of turret, or building usually insulated, and contained under a single roof; sometimes square, and sometimes in form of a dome; thus called from the resemblance of its roof to a tent.

The word comes from the Italian *padiglione*, tent; and that from the Latin *papilio*.

Pavilions are sometimes also projecting pieces, in the front of a building, marking the middle of them. Sometimes the pavilion flanks a corner, in which case it is called an *angular pavilion*. The Louvre is flanked with four pavilions. The pavilions are usually higher than the rest of the building.

There are pavilions built in gardens, popularly called summer-houses, pleasure-houses, &c. Some castles or forts consist only of a single pavilion.

PAVILION, in *Heraldry*, denotes a covering in form of a tent, which invests, or wraps up, the armories of divers kings and sovereigns depending only on God, and their sword.

The French heralds hold, that none but sovereign monarchs may bear the pavilion entire, and in all its parts.

The pavilion consists of two parts: the top, which is the chapau, or coronet; and the curtain, which makes the mantle. Those who are elective, or have any dependence, say the heralds, must take off the head, and retain nothing but the curtains.

The use of pavilions and mantles in armories are derived from the ancient lambrequins, which are sometimes found stretched out in form of coverings; and tucked back on either side.

Others will have it derived from the ancient tournaments, wherein were exposed the arms of the knight, in rich tapestry-work, on tents and pavilions, with the chiefs of the quadrils planted to shelter themselves in, till the time of entering the lists.

PAVILION, in *War*, denotes a tent raised on poles to lodge under in the summer time. See *TEXT*.

PAVILION is also sometimes applied to flags, colours, ensigns, standards, banners, &c. all which authors usually confound with one another.

The custom of bearing pointed pavilions, as at present, first came from the Mahometan Arabs, at the time when they conquered Spain. Till then, all colours were stretched

on cross pieces like church-banners; whence they were called in Latin, *vesilla quasi velilla*, a diminutive of *vela*, sails.

The pirates all along the coasts of the Atlantic, and Barbary, bear hexagonal pavilions, gules, charged with a little Turk, dressed in his turban; though contrary to their law, which prohibits the making any image of a man; from an opinion that those who make the figure here will be obliged to furnish a soul for it at the day of judgment, or, in default thereof, be damned.

But this portrait, it seems, is that of Hali Sulficar, Mahomet's son-in-law, to whose party the Africans adhere: and who appointed his picture to be represented on their banners; imagining himself so terrible to the Christians, that the mere sight of his image would put them to flight; as we are told by Leunclavius.

PAVILIONS, among *Jewellers*, the under sides and corners of the brilliants, lying between the girdle and the collet.

PAULLAC, in *Geography*, a town of France, in the department of the Gironde; and chief place of a canton, in the district of Lesparre; 10 miles S.E. of Lesparre. The place contains 1443, and the canton 6941 inhabitants, on a territory of 165 kilometres, in six communes.

PAVILLON, STEPHEN, in *Biography*, a man of letters, was born at Paris in 1632. He was educated for the law, and obtained the post of advocate-general of Metz, but a delicate constitution, and a love of study and refinement, caused him to resign that office, and devote himself to literature. The mildness of his manners, and the charms of his conversation, procured him many distinguished friends, and during the fits of the gout, to which he was a martyr, his chair was surrounded by persons of rank and eminence. He refused the office of preceptor to a young prince, though it seemed to open the way to a good fortune. Lewis XIV. gave him a pension of 2000 livres. He died in 1705, at the age of 73. He was a member both of the French academy, and that of Inscriptions, without having solicited a seat in either. His literary reputation was chiefly founded on his poems, which were characterized by ease, gaiety, and great delicacy. The most complete edition of his works was printed at Paris in two vols. 12mo 1747. Moreri.

PAVILLY, in *Geography*, a town of France, in the department of the Lower Seine, and chief place of a canton, in the district of Rouen; nine miles N.W. of Rouen. The place contains 2245, and the canton 14,584 inhabitants, on a territory of 155 kilometres, in 25 communes.

PAVISADE, and PAVISORS. See PAVAIS.

PAUKATUCK, in *Geography*, a small river of America, which runs into Stonington harbour, and forms a part of the division line between Connecticut and Rhode island.

PAUL, ST., called also SAUL, in *Sacred Biography*, an eminent apostle of Jesus Christ, was a descendant of the patriarch Abraham, of the tribe of Benjamin, and a native of Tarsus, then the chief city of Cilicia. He was also by birth a citizen of Rome. (Acts, xvi. 37, 38. xxii. 25, 29, xxiii. 37.) This privilege he claimed by his birth, and not, as Dr. Lardner has shewn, by his nativity at Tarsus, which does not appear to have been a municipium, or town of Roman citizens. The excellent writer just named supposes, that some of St. Paul's ancestors had obtained the privilege of citizenship for services performed to the Roman commonwealth in the wars. (Vid. Grotius ad Act. xxii. 28.) His father was a Pharisee, and he himself was of the same sect. (Acts, xxiii. 6. xxvi. 5. Philip. iii. 5.) His sister's son, and some others of his relations, were Christians, and had been so before his conversion; and this circumstance is alleged as a proof of the virtue and piety of his family. That St. Paul was educated in Greek literature in his early life

life at Tarsus, may be inferred from the place of his nativity, which was celebrated for polite learning, and also from his quotations of several Greek poets. (Acts, xvii. 28. 1 Cor. xv. 33. Titus, i. 12.) It appears that he was likewise for some time under the instructions of Gamaliel, a celebrated Jewish rabbi, at Jerusalem, and that he had made great proficiency in the study of the law, and the traditions, much esteemed by that people. (Acts, xxii. 3. xxvi. 5. Gal. i. 14.) He seems to have been a person of great natural abilities, of quick apprehension, strong passions, and firm resolution, and thus qualified for signal service, as a teacher of such principles as he should embrace, whatever they were. He appears likewise to have been always unblameable in his life, and strictly faithful to the dictates of his conscience, according to the knowledge which he had. This appears from his appeals to the Jews, (Acts, xxiii. 1. xxvi. 4, 5.) and from the undissembled satisfaction which he expresses upon a serious recollection of his former and later conduct. (Philip. iii. 6. 1 Tim. i. 13. 2 Tim. i. 3.) For some time after the first appearance of Christianity in the world, he was a bitter enemy, and furious opposer of all who made profession of it. Nevertheless he did not long persist in that course; but was converted, in an extraordinary manner, to that faith himself; and ever after he was a steady friend, and zealous advocate for it, and very successful in defending and propagating it, diligently improving the gifts and qualifications extraordinarily vouchsafed for that purpose. These particulars are recorded in those writings which are in the highest esteem, and reckoned sacred among Christians, and indeed well known to all the world.

Dr. Lardner has taken great pains to settle the time of his conversion; and this has been thought the more necessary, as various opinions have been entertained among ancient writers, cited by Valesius in his Annotations upon Eusebius's Eccl. Hist. and also among the moderns. Some thought that Stephen was stoned and Paul converted in the year of our Lord's ascension, A. D. 33, or the beginning of the year following. Pearson supposes, that Stephen was stoned in 34, and Paul converted in 35, near the end of the year. Frederic Spanheim, after diligent inquiry, fixes the conversion of Paul in the year 40, the last of Caius Caligula; and inclines to defer it to the first of Claudius, or the year 41. Witius and J. A. Fabricius adopt the same opinion. Lenfant and Beaufobre place his conversion in the year 36, and his first coming to Jerusalem after it in 39; and this opinion is thought by Dr. Lardner to be nearer the truth than any of the foregoing. Upon the whole Lardner concludes that Paul was converted in 37, or possibly, before the end of the year 36; and Stephen was stoned in the beginning of the same year, or, at the soonest, near the end of the year 35. The first notice we have of Paul is in the account of St. Stephen's martyrdom; and it is probable, that he had not long before made his appearance in the world. If we advert to his situation and circumstances, we shall discern the proper vindication of his moral character. It is probable, that he had not seen Jesus during his abode on earth; and it is possible that he did not come from Tarsus to Judea, till after the close of our Lord's ministry; nor is it any unfair supposition, that he had not any acquaintance with any of Christ's apostles, and that he had not seen any miracles wrought by them, before he became a persecutor; and afterwards, he would not admit of instruction from the followers of Jesus. Whilst he was under the tuition of Gamaliel, we may reasonably imagine, that he knew little of the public affairs of Judea, though he was in that country; but when he came from the schools, animated with a high degree of zeal for the law of Moses, and for the traditions of its elders, and found a number of

men, called followers of Jesus, who spoke of him as the Messiah, and as raised from the dead, representing him as greater than Moses himself, he was filled with indignation, and thought that it was his duty to oppose them to the utmost, which he did till Jesus met him and reclaimed him. Although he speaks of himself as *injurious* (1 Tim. i. 13. Acts, xxvi. 10.), yet we may suppose that, even then, he would not have injured any man, in his person or property, from worldly considerations. The moving principle by which he was actuated was not envy, malice, covetousness, or any worldly view, but a false zeal for God and religion; and this induced him to be a persecutor, which is a character, in certain circumstances, not inconsistent with integrity. This might have been the case, with respect to Paul, who was a young man, little acquainted with the world, and just emerging from a Jewish school, where he had been engaged in the study of the law, and the Rabbinical interpretations of it. To this purpose Chrysostom distinguishes between Paul and the Jews; observing that he had a sincere zeal for religion, according to his knowledge at that time, and that they had no concern for Jerusalem, and aimed at nothing but their own honour. But although Paul was sincere, and did not act contrary to conviction, his conduct cannot be justified. He should have examined; he should have taken care to be well informed: if, upon his first coming out into the world, he had pursued this course, he might have received satisfaction, and consequently might have been prevented from acting that part against Jesus, and his disciples, which he afterwards bewailed. His prejudices, however, were strong; and they were not to be overcome in an ordinary way. But though he was prejudiced, he was not obstinate. Our blessed Lord knew him to be tractable, and open to conviction; and he knew, that the measures which he adopted for this purpose would change his heart, and melt him down to ready obedience. The event corresponded to expectation. Although he sat out for Damascus under the full influence of enmity against the disciples of Jesus, he was soon changed, as the history (Acts, ix. 3—6) relates. He trembles and acquiesces, all his rage was subdued, and he became a disciple of Jesus.

Satisfied in his own mind, he imagined that others would manifest a disposition similar to his own, and that an account of his conversion, with all the reasons and circumstances of it, which he was prepared to lay before his countrymen, the Jews, must persuade them. Jesus better knew the disposition and character of the people, whom he thought of convincing and reclaiming; and therefore, instead of permitting him to labour unprofitably among them, renewed his orders to Paul, to proceed, without delay, in the work of preaching to the Gentiles, on which he had already entered. The event proved that the over-ruling providence of God disposed of his person and concerns more wisely and more beneficially than he was capable of judging and acting for himself. It was a very happy and favourable circumstance, that he did not return to Judea immediately after his conversion; because the violent persecution, which commenced about the time of Stephen's death, had continued at least three years after Paul left Judea to go to Damascus.

Dr. Lardner has taken pains to settle Paul's age at the time of his conversion. Witius supposes that he was born near the end of Herod's reign, about the same time with our Saviour. In the epistle to Philemon, (v. 9.) written about the year of the vulgar era 62, he calls himself Paul the aged; and this must lead us to suppose, that he was then 60 years of age, or not much less. In the account of the martyrdom of Stephen, he is called a young man (Acts, vii. 58.); but among the ancients the term youth is used with latitude: and

ST. PAUL.

from some circumstances related of him at that time (Acts, xxvi. 10—12.) we have reason to conclude, that he was arrived to years of maturity, or discretion; and that at the time of his conversion he was of an age at which men are able to judge concerning the evidence of things, and so form a reasonable determination with regard to their future conduct.

It has been generally supposed, that Paul was called to the apostleship at the time of his conversion, or very soon after it. Spanheim, Witius, Cave, Pearson, Basnage, and Hallet are of this opinion. The requisite qualification of an apostle appears to have been, that he should see Christ in person, and that after his resurrection. (See Acts, i. 21, 22.) Accordingly Paul, when he claims the character of an apostle, speaks of his having seen Christ, as a fact well-known and uncontroverted. (1 Cor. ix. 1. 8. 9.) In his way to Damascus, Christ had personally appeared to him. (Acts, ix. 3—6.) The learned author, of whose research we are availing ourselves in the compilation of this article, thinks it highly probable, from all the accounts which we have of Paul's wonderful conversion, (Acts, ix. xxii. and xxvi.) that he received his apostolical commission from the mouth of Christ in person, when he called to him from heaven, and spoke to him in the way to Damascus. As he was, from the beginning, called, and appointed to be an apostle, he was by degrees qualified for it as his commission opened; and in time he was called out by divine providence to the full execution of it.

Paul, having been baptized by Ananias at Damascus, stayed for a short time with the disciples there, and then went into Arabia, where he probably might meet with some believers. (Acts, ii. 11. 41.) Whilst he remained in Arabia, he was fully instructed, as we may reasonably think, by special revelation, in the doctrines preached by Jesus Christ, when on earth, and all the things said and done by him, and his sufferings, crucifixion, resurrection, and ascension, the fulfilment of the ancient prophecies in Jesus, the Christ, the son of David, and the son of Abraham; and received also the holy ghost, in a measure equal to that of other apostles. He was thus qualified to preach the gospel, and to testify the resurrection of Jesus, and to prove him to be the Christ, without receiving either instruction or gifts from other apostles. Having been some time in Arabia, he returned to Damascus; but here a design being formed against his life, he removed to Jerusalem. (Acts, ix. 20. 25.) The period of three years, or three years and somewhat more, which elapsed from Paul's conversion to his coming to Jerusalem, reaches, according to Lardner's computation, from near the end of the year 36 to near the end of 39, or the beginning of the year 40, or from the beginning of the year 37 to the former part of the year 40. Paul travelled through the countries of Cilicia and Syria, during the remainder of the year 40, and the whole of 41, and 42, or the greatest part of the last-mentioned year, till about the beginning of the year 43, preaching, undoubtedly, in the name of Jesus, to native Jews, and to profelytes of the Jewish religion. Afterwards he went to Antioch, and began to preach to Gentiles. Here he probably had the rapture, mentioned by him (2 Cor. xii.) Having fulfilled the commission, mentioned Acts, xi. 27—30, by a journey to Jerusalem, where, in the year 44 he had the trance taken notice of in his speech to the Jewish people (Acts, xxii. 17—21), Paul, and also Barnabas, who had accompanied him, soon after this, left Antioch, and made a farther progress in preaching the gospel to Gentile people. For this journey Pearson allots three years, viz. 45, 46, 47, and somewhat more. Tillamont thinks, it might have been performed in two years, from 44 to 46; or from the beginning of the year

45 to the former part of the year 47, which is Lardner's opinion. Having made some stay at Antioch after their return, they attended a council at Jerusalem, held in the year of Christ 49, or in the beginning of the year 50, and afterwards returned to Antioch. In the beginning of the year 50, St. Paul and Barnabas set out from Antioch; and having gone through Syria and Cilicia, they came to Phrygia; and it is very probable, that Paul preached in the chief cities of that country, Hierapolis, Laodicea, and Colosse. St. Paul also went to Galatia, and there founded many churches; but they were forbidden to preach in Asia, properly so called. After passing through several countries and cities, mentioned in the book of Acts, ch. xvi. xvii. xviii. St. Paul went to Corinth, where he might have been before the end of the year 51. Here he tarried a year and six months, *i. e.* as Lardner supposes, the remainder of the year 51, the whole of 52, and part of 53. Having passed through Galatia and Phrygia, he came to Ephesus, before the end of the year 53, in October or November; and here he remained till the year 56, about pentecost. As the emperor Claudius died Oct. 13, in the year 54, the tidings of his death, and the accession of Nero, might not have reached Ephesus before the beginning of the year 55. Soon after St. Paul determined to visit Rome, proposing first to go to Macedonia, Greece, and Jerusalem. (Acts, xix, xx.) Some time before pentecost, or about that season, in the year 56, Paul left Ephesus to go into Macedonia. Here he staid about a year; at Corinth he staid three months; and there must have elapsed an interval of two years, or nearly as much, between Paul's leaving Ephesus and coming to Troas, in his way to Jerusalem. At this time Paul was in Illyrium and Crete. He arrived in Jerusalem at the pentecost in the year 58. From Jerusalem he was sent away to Rome near the end of the year 60. (See Acts, xxi. 17. ch. xxvi. 1—32.) In ch. xxvii and xxviii. 1—16. we have a very distinct relation of Paul's voyage to Rome; where he arrived in the spring of the year 61; and he was released from his confinement in the former part of the year 63. It has been a subject of debate, whither Paul went after he had obtained his liberty. Some think that he went from Rome to Spain; but Lardner is of opinion that he came from Rome to Jerusalem, as soon and as directly as he could. Here he made a short stay, and from Judea he went to Ephesus; from Ephesus he might go to Laodicea and Colosse; and, possibly, he returned to Rome by Troas, Philipp, and Corinth. It is the opinion of Pagi and Basnage, that Peter and Paul suffered martyrdom in the year of Christ 65. Orosius, they say, having given an account of Nero's persecution of the Christians, and of the death of the two apostles in it, adds, that it was followed by a pestilence in the city, and other disasters. Sulpicius Severus has given an account of the fire at Rome, and Nero's persecution of the Christians, and also of the martyrdom of Peter and Paul therein; adding, that while these things were doing at Rome, the Jews, being uneasy under the oppressions of their governor Gessius Florus, began to rebel; upon which passage Basnage observes, the Jewish war began in May 66; and therefore the martyrdoms of the apostles happened in the year before, that is, 65. Epiphanius places the death of Peter and Paul in the 12th year of Nero, part of which, as he says, fell in the year 65. Dr. Lardner does not presume to assign positively the year of the martyrdom of these two apostles; he is of opinion that they did not survive the year 65; but he cannot say whether their martyrdoms happened in the year 64 or 65. If Peter and Paul were come to Rome before the city was set on fire, and before the persecution of the Christians began, which is not improbable, they

they might be taken up and soon put to death before the end of the year 64. Lardner's Works, vol. vi.

For an account of the undesign'd and casual, but very remarkable, coincidence or correspondence, between the circumstances that are recorded in the history of St. Paul's preaching and travels, and others, similar to them, which are either explicitly stated, or obviously implied, in the epistles of the same apostle; and of the conclusion that results from this coincidence in favour of the truth of the history, and the genuineness of the epistles, we refer to archdeacon Paley's excellent work, entitled "Horæ Paulinæ." See ACTS of the Apostles, and PALEY.

Lord Lyttelton, in his "Letter to Gilbert West, esq.," has deduced from the conversion and apostleship of St. Paul, an argument, which, duly considered, amounts of itself to a demonstration sufficient to prove Christianity to be a divine revelation. Although within our limits we cannot do full justice to the admirable reasoning of this distinguished advocate for our holy religion, we shall endeavour to give such an abstract of it as may testify our own conviction of the truth of Christianity, and promote similar sentiments concerning it in the minds of our readers. Our noble author, having cited from the book of the Acts (ch. ix. 12. 18. xx. 6. 13. 14. xxii. 10—16. xxvii. 1, &c.) the account which St. Paul himself gives of his conversion and preaching, and which is recorded in his history by a contemporary author, and a companion of the apostle, compares these records with the manner in which St. Paul speaks of himself in the epistles written by him to the several churches which he planted, and the authenticity of which cannot be doubted without overturning all rules, by which the authority and genuineness of any writings can be proved or confirmed. (See Galat. i. 11—16. Philip. iii. 4—8. 1 Tim. i. 12, 13. 2 Cor. i. 1. Col. i. 1. 1 Tim. i. 1. Gal. i. 1. 1 Cor. xv. 2.) He then states, that the person who attests these things of himself, and of whom they are related in so authentic a manner, either was an impostor, who said what he knew to be false with an intent to deceive, or an enthusiast, who, by the force of an overheated imagination, imposed upon himself; or, he was deceived by the fraud of others, and all that he said must be imputed to the power of that deceit; or what he declared to have been the cause of his conversion, and to have happened in consequence of it, did all really happen; and therefore the Christian religion is a divine revelation.

That the apostle was not an impostor, who said what he knew to be false with an intent to deceive, our author undertakes to prove, by shewing that he could have no rational motives to engage in such an imposture, nor could have possibly carried it on with any success by the means which we know he employed. His inducement to such an imposture must have been one of these two, either the hope of advancing himself by it in his temporal interest, credit, or power, or the gratification of some of his passions under the authority of it, and by the means it afforded. From the circumstances in which St. Paul declared his conversion to the faith of Christ, and which our author has recited, it appears to every reasonable person's satisfaction, that he could have had no hope of increasing his *wealth*. The certain consequence of his taking the part he did, was not only the loss of all that he had, but of all hopes of acquiring more. Those whom he left were the disposers of wealth, of dignity, and of power, in Judea; those with whom he united were indigent men, oppressed, and deprived of all means of improving their fortunes. Those among them, who had more than the rest, shared what they had with their brethren; and even with this assistance, the whole community was hardly supplied with the necessaries of life, and even in churches

which he afterwards planted himself, which were much more wealthy than that of Jerusalem, St. Paul was so far from availing himself of their charity, in order to draw that wealth to himself, that he often refused to take any part of it for the necessaries of life. (See 1 Cor. xv. 8. 2 Cor. xii. 14. 1 Thess. ii. 4, 5, 6. 9. 2 Thess. iii. 8. Acts, xx. 33, 34.) As to credit or reputation, that also lay altogether on the side he forsook. The sect he embraced was under the greatest and most universal contempt of any then in the world; the chiefs and leaders of it were men of the lowest birth, education, and rank; they had not a single advantage of parts or learning, or other human endowments to recommend them; the doctrines they taught were contrary to those which they, who were accounted the wisest and the most knowing of their nation, professed; the wonderful works they did were imputed either to magic or to imposture; the very author and head of their faith had been condemned as a criminal, and died on the cross between two thieves. Could the disciple of Gamaliel think he should gain any credit or reputation by becoming a teacher in a college of *fishermen*? Could he flatter himself, that, either in or out of Judea, the doctrines he taught could do him any honour? He knew and professed the contrary. Experience soon convinced him that, in all parts of the world, contempt was the portion of any one who engaged in teaching a mystery so unpalatable to all mankind, to all their passions and prejudices, and so irreconcilable to the pride of human reason, as "Christ crucified," which was "a stumbling block to the Jews, and to the Greeks foolishness." "We are made (says he to the Corinthians) as the filth of the world, the off-scouring of all things unto this day." Yet he went on as zealously as he set out, and was "not ashamed of the gospel of Christ." The desire of glory, or the ambition of "making to himself a great name," was, therefore, not his motive to embrace Christianity. But was it the love of power? Power! over whom? over a flock of sheep driven to the slaughter, whose shepherd himself had been murdered a little before. All he could hope from that power, was to be marked out in a particular manner for the same knife, which he had seen so bloodily drawn against them. Could he expect more mercy from the chief priests and the rulers, than they had shewn to Jesus himself? Would not their anger be probably fiercer against the deserter and betrayer of their cause than against any other of the apostles? Was power over so mean and despised a class of men worth the attempting with so much danger? But let it be considered, what power St. Paul actually assumed and exercised over the Christians. Did he pretend to any superiority over the other apostles? So far from it, that he declared himself *the least of them* (Ephes. iii. 8.) and *less than the least of all saints*. (1 Cor. xv. 9.) In the churches which he himself planted, he never pretended to any primacy or power above the other apostles. (See 1 Cor. i. 12, 13. 1 Cor. iii. 5. 2 Cor. iv. 5.) The authority which St. Paul exercised over Christians was purely of a spiritual nature, tending to their instruction and edification, without any mixture of that civil dominion in which alone an impostor can find his account. In this respect his authority was very different from the dominion acquired and exercised under a pretence of divine inspiration, by many ancient legislators; by Minos, Rhadamanthus, Triptolemus, Lycurgus, Numa, Zaleucus, Zoroaster, Xamolxis: nay, even by Pythagoras, who joined legislation to his philosophy, and, like the others, pretended to miracles and revelations from God, to give a more venerable sanction to the laws which he prescribed. Such, in later times, was attained by Odin among the Goths, by Mahomet among the Arabians, by Mango Capac among the

the Peruvians, by the Sofi family among the Persians, and that of the Zeriffs among the Moors: and to such a dominion did many false Messiahs among the Jews aspire. In such and similar instances, a *spiritual* authority was only desired as a foundation for *temporal* power, or as a support of it. How different were the views and conduct of St. Paul! He made no innovation in government or civil affairs: he meddled not in legislation, he formed no commonwealths, he raised no seditions, he affected no temporal power. He both taught and practised obedience to civil rulers; nor did he practise any of those soothing arts by which ambitious and cunning men recommend themselves to the favour of those whom they endeavour to subject to their power. What was wrong in his disciples he reproved in a manner becoming a teacher from God; and as were his discourses when present with them, so were likewise his writings, when absent. (See Phil. iii. 15, 16, 17.) If it be said that he affected an *absolute* spiritual power over the churches which he formed, it may be replied, that *he preached CHRIST JESUS, and not himself*. He even renounced any advantage which a higher education, superior learning, and more use of the world might have afforded him for claiming to himself any superiority over the other apostles. (See 1 Cor. ii. 1, 2-5.) An impostor, on the contrary, would have availed himself of these advantages for securing pre-eminence and influence to himself.

As St. Paul had nothing to *gain* by his new profession, let us consider what he *gave* up, and what he had reason to *fear*. He gave up a *fortune* which he had a fair opportunity of advancing: he gave up that *reputation* which he had acquired by the labours and studies of his whole life, and by a behaviour, which had been *blameless, touching the righteousness which is in the law* (Phil. iii. 6.); he gave up his *friends, his relations, and family*, from whom he estranged himself for life; he gave up that *RELIGION, in which he had profited above many of his equals in his own nation, and those TRADITIONS of his fathers, which he had been more exceedingly zealous of*. (Gal. i. 14.) Such were the sacrifices which he made in becoming a Christian. The inconveniences he had to *fear* were, the implacable *vengeance* of those whom he deserted; that sort of *contempt*, which is hardest to bear, the contempt of those whose good opinion he had most eagerly sought: and those other complicated *evils*, which he describes in the 11th chapter of the second epistle to the Corinthians; evils, the *least* of which were sufficient to have frightened any impostor even from the most hopeful and profitable cheat.

The next object of enquiry is, whether the gratification of any other passion, besides the desire of wealth, fame, or power, under the authority of the religion to the profession and service of which he was devoted, or by the means which it afforded, could be his inducement to becoming a disciple and apostle of CHRIST. His writings and his conduct furnish the most satisfactory answer to this enquiry. The former breathe nothing but the strictest morality, obedience to the order and government of magistrates, with the utmost abhorrence of all licentiousness, idleness, or loose behaviour, under the cloak of religion (Rom. xi. xiii. Col. iii.): and the latter, both before and after his conversion to Christianity, does not bear any mark of a licentious disposition. See his appeal to the Thessalonians, (1 Thess. ii. 10. See also 2 Cor. i. 12. iv. 2. vii. 2.) If it should be again said, that although St. Paul could have no selfish or interested view in undertaking such an imposture, yet for the sake of its moral doctrines, he might be inclined to support the Christian faith, and make use of some pious frauds to advance a religion, which, though

erroneous and false in its theological tenets, and in the facts upon which it was founded, was in its precepts and influence beneficial to mankind. In discussing this subject, it should be recollected, that the circumstances of St. Paul were very different from those of some good men in the Heathen world, who pretended to divine revelation, and introduced or supported doctrines and forms of religion which they knew to be false, under a notion of public utility. They not only did it to serve good ends, but were secure of its doing no harm. Thus when Lycurgus persuaded the Spartans, or Numa the Romans, that the laws of the one were inspired by Apollo, and those of the other by Egeria; when they taught their people to put great faith in oracles, or in augury, no temporal mischief, either to them or to their people, could attend the reception of that belief. It drew on no persecutions no enmity with the world. But at the time when St. Paul undertook the preaching of the gospel, to persuade any man to be a Christian, was to persuade him to expose himself to all the calamities human nature could suffer. This St. Paul knew. (See Thess. iii. 4. 2 Cor. vi. 4, 5. Eph. vi. 10-16. Phil. i. 28-30. Col. i. 9-11. Rom. viii. 35, 36.) Could any man who had in his nature the least spark of humanity subject his fellow-creatures to so many miseries, as were justly to be expected, and even actually announced? or could one that had in his mind the least ray of reason, expose himself to share them with those he deceived, in order to advance a religion which he knew to be false, merely for the sake of its moral doctrines? Such an extravagance is too absurd to be even supposed. The case of St Paul was, in one respect, different from that of the other apostles. To them it may be objected, by those who are resolved not to credit their testimony, that having been deeply engaged with JESUS, during his life, they were obliged to continue the same professions after his death, for the support of their own credit, or from having gone too far to recede. This can by no means be said of St. Paul. If there can be any force in this reasoning, it tends to convince us, that St. Paul must actually have continued a Jew, and an enemy of CHRIST JESUS. If they were engaged on one side, he was as strongly engaged on the other. If shame withheld them from changing sides, much more ought it to have restrained him, who, being of a much higher education and rank in life than they, had more credit to lose, and must be supposed to have been much more sensible to that sort of shame. The only difference was, that they, by quitting their master after his death, might have preserved themselves; whereas he, by quitting the Jews and taking up the cross of CHRIST, certainly brought on his own destruction. Upon the whole we may very justly conclude, that when a man of St. Paul's understanding embraced the faith of CHRIST, he was in reality convinced of the truth of it, and that, consequently, he was not an impostor, who said what he knew to be false, with an intent to deceive.

If it be again said, that St. Paul might have been capricious, and might have acted without any rational motive; to this kind of argument it may be replied, that if he had been so unaccountably wild and absurd as to undertake an imposture so unprofitable and dangerous both to himself and to those who were deceived by it, he could not possibly have carried it on with any success by the means which he is known to have employed. His imposture was such, that it could not have been carried on by one man alone. He could not have acted as he did, but in confederacy at least with the apostles; but till he came to Damascus, he had no communication with the apostles; he acted in no concert with them, and learnt nothing from them.

them, except the doctrines which they had publicly taught to all the world. When he came there, he told the Jews, to whom he had brought letters from the high-priest and the synagogue against the disciples of CHRIST, of his having seen, in the way, a light from heaven, and heard CHRIST JESUS reproaching him with his persecution, and commanding him to go into the city, where it should be told him what he was to do. But to account for his choosing this method of declaring himself a convert to CHRIST, we must suppose that all who came with him, when he pretended he had his vision, were his accomplices: and yet, how can we suppose, that all these men should be willing to join in this imposture? They were either officers of justice, employed in executing the orders of the high-priest and the rulers against the Christians; or they were persons chosen for this expedition because they might be trusted for their zeal in promoting its object. The instructor at Damascus, to whom he was referred, must also have been his accomplice; and yet they appear to be absolute strangers to one another. But how could this man venture to act such a dangerous part, without the consent of the other disciples, especially of the apostles, or by what means could he obtain their consent? But would it not have been much more easy to have made Saul be present at some pretended miracle wrought by the disciples, or by Ananias himself, when none were able to discover the fraud, and have imputed his conversion to that, or to the arguments used by some of his prisoners whom he might have discoursed with, and questioned about their faith, and the grounds of it, in order to colour his intended conversion? This would have been the safest, and also the most natural method of bringing about such a change, instead of ascribing it to an event which lay so open to detection. If this story had been an imposture, and Ananias had joined with Paul in carrying it on, is it not strange, that, after their meeting at Damascus, we should never hear of their consorting together, or acting in concert? But dismissing this part of the business; how could Paul get himself owned and received as an apostle by the apostles? This was necessary to be done without delay, but instead of attending to this very important, and, indeed, essential object, St. Paul went into Arabia, and then returned again to Damascus; nor did he go to Jerusalem till after an interval of three years. (Gal. i. 17, 18.) He had also exposed himself to danger, when at Antioch he withstood Peter to the face, and reproved him before all the disciples, because he was to be blamed. (Gal. ii. 11—14.) Accomplices in a fraud are obliged to shew greater regards to each other; such freedom belongs only to truth. Moreover, in the enterprise he undertook of going to the Gentiles, making himself their apostle, and converting them to the religion of CHRIST, he had many difficulties to encounter among the Gentiles themselves. In this enterprise, he had to contend with the policy and power of the magistrates; with the interest, credit, and craft of the priests; with the prejudices and passions of the people; and with the wisdom and pride of the philosophers. His success against this combined opposition he ascribes to the efficacy of divine power. (1 Cor. ii. 4. 1 Thess. i. 5.) If that power attended him, it would enable him to overcome all those difficulties that obstructed his enterprise; but then he was not an impostor. Our enquiry, therefore, must be, whether (supposing him to have been an impostor) he could, by pretending to miracles, have overcome all those difficulties, and carried on his work with success? For this purpose, two circumstances were principally necessary: an apt disposition in those whom miracles are designed to impose upon, and a

powerful confederacy to carry on and assist the cheat. But what prepossessions could there have been in the minds of the Gentiles, either in favour of Paul or the doctrines he taught? or rather, what prepossessions could be stronger than those, which they undoubtedly had against both? Without the advantage of this predisposition, and the assistance it would have afforded, was there any confederacy strong enough to impose his false miracles upon the Gentiles, who were both unprepared and indisposed to receive them? The contrary is apparent from the nature of the case, and the history of the apostle.

Our illustrious author, having proved that St. Paul was not an impostor, proceeds to consider whether he was an enthusiast, who, by the force of an overheated imagination, imposed upon himself. The ingredients, he says, of which enthusiasm is generally composed, are, great heat of temper, melancholy, ignorance, credulity, and vanity or self-conceit. He then shews, that none of these qualities, which dispose the mind to enthusiasm, and which are characteristic of it, belonged to St. Paul. His zeal indeed was eager and warm, but tempered with prudence, and even with the civilities and decorums of life, as appears by his behaviour to Agrippa, Festus, and Felix: not the blind, inconsiderate, indigent zeal of an enthusiast. As to melancholy, it neither appears by his writings, nor by any thing told of him in the Acts of the Apostles, nor by any other evidence, that St. Paul was inclined to it more than other men. As to ignorance, St. Paul was so far from it, that he appears to have been master, not of the Jewish learning alone, but of the Greek. The history of his life likewise shews, that St. Paul could not be justly chargeable with credulity. On the contrary, he seems to have been slow and hard of belief in the most extreme degree, having paid no regard to all the miracles performed by our Saviour, to the fame of which he could not be a stranger, as he lived at Jerusalem; nor to that signal one wrought, after his resurrection, and in his name, by Peter and John, upon the lame man at the beautiful gate of the temple; nor to the evidence given in consequence of it by Peter, in presence of the high-priest, the rulers, elders, and scribes, that CHRIST was raised from the dead. Other circumstances are enumerated, which amply vindicate the apostle from this charge. From vanity or self-conceit St. Paul was as free as any man, as we may collect from all that we see in his writings, or know of his life. Throughout his epistles, there is not one word that favours of vanity, nor is any action recorded of him, in which the least mark of it appears. See Eph. iii. 8. 1 Cor. xv. 9. 1 Tim. i. 15, 16. 2 Cor. xii. 12. xi. 1. 16—19. 30. xii. 2. 6. 1 Cor. xv. 10. xiii. 2, 3, 4.

Allowing, for the sake of argument, that St. Paul was an enthusiast, our author shews that he could not have imposed on himself by any power of enthusiasm, either in regard to the miracle that caused his conversion, or to the consequential effects of it, or to some other circumstances to which he bears testimony in his epistles. Although the power of imagination in enthusiastical minds is very strong, yet it always acts in conformity to the opinions imprinted upon it at the time of its operation, and can no more act against them than a rapid river can carry a boat against the current of its own stream. The mind of St. Paul, in his way to Damascus, was strongly prepossessed with opinions against CHRIST and his followers. His passions concurred at that time in giving those opinions a more active force: and therefore whatever delusions his imagination might raise to impose on his reason, must at that time have been raised agreeably to the notions imprinted upon it, and by which it was heated to a degree of enthusiasm, not

in direct contradiction to all those notions, while they remained in their full force. With respect to the *vision* that is recorded in this part of his history, it is plain that it could not have been a phantom of his own creation, because he was not *alone* when he saw it: many others were in company, whose minds were no better disposed than his to the Christian faith, and it must be supposed, against all motive and all possibility, that the imaginations of *all* these persons were, at the *same* time, so strangely affected, as to make them believe that they saw and heard what in reality never occurred. But supposing, that, as Saul and his companions were journeying towards Damascus, an extraordinary meteor did actually appear, how shall we account for the *distinct words* heard by St. Paul, to which he made answer, and for what followed, agreeably to these words, on his arrival at Damascus? That St. Paul saw CHRIST, both *now* and *after* this time, appears not only by what he relates Acts, xxii. 17, 18; but by other passages in his epistles, 1 Cor. ix. 1. xvi. 8. Acts, ix. 17. From him, as he asserts in many places of his epistles, he learned the gospel by immediate revelation, and by him he was sent to the Gentiles: Acts, xii. 31. xxiii. 11. If St. Paul had been a mere *distempered enthusiast*, how can we account for the miracles he wrought, and for the progress he made in converting the Gentile world? If the difficulties that impeded his efforts for this purpose were such as the ablest impostor could not have overcome, how much more insurmountable were they to a madman? Of all the miracles recorded in scripture, none are more clear from any possible imputation of being the effect of an enthusiastic imagination than that of persons speaking languages which they had never learned: and it is a power which has never been pretended to by any enthusiast, ancient or modern.

Having shewn that St. Paul could not be an enthusiast, who, by the force of an over-heated imagination, imposed on himself, our noble author proceeds to enquire, whether he was *deceived* by the *fraud* of others, and whether all that he said of himself can be imputed to the power of that deceit? But this supposition is so palpably absurd, that we need not enlarge in the confutation of it.

If, then, the apostle was not deceived by the fraud of others, and what he said of himself cannot be imputed to the power of that deceit, no more than to wilful imposture or enthusiasm, it must follow, that what he related to have been the cause of his conversion, and to have happened in consequence of it, did assuredly happen, and therefore "the Christian religion is a divine revelation." See two excellent sermons on the subject of this article by Dr. Duchal, in his "Presumptive Arguments, &c." forming the fourth volume of his sermons, but published separately.

PAUL, *Epistles of St.* See EPISTLE.

PAUL, *Apocryphal books under the name of St.* See APOCRYPHA.

PAUL, *Hermits of St.* See HERMIT.

PAUL'S *Art.* See ART.

PAUL of Samosata, in *Biography*, so named from the place of his birth, was a celebrated prelate of the third century, after whom such Christians as entertained the same opinions were generally called Paulians, till the council of Nice. In the year 260 he was chosen bishop of Antioch, and by his talents and character recommended himself to the favour of Zenobia, the celebrated consort of Odenatus. He rendered himself obnoxious to the orthodox by denying the doctrine of the pre-existence of Christ, and maintaining that he was a mere man, on whom the wisdom of God descended from

heaven, and dwelt in him, enabling him to work miracles, and instruct nations. A council was assembled at Antioch in the year 264, before which Paul was accused of a dangerous heresy, and of a life and conversation unworthy of the episcopal character. The result of this accusation was, that Paul was admonished. For this mild sentence he was probably indebted to the prudence and moderation of Firmilian, bishop of Caesarea, who presided in the council, and prevented those who composed it, by his influence, from adopting harsher measures. In the year 269 or 270, a second council was assembled at Antioch, in order to take into consideration the principles and conduct of the bishop. Firmilian was summoned to this council, but died on his journey towards Antioch, and it was owing to this event that the enemies of Paul succeeded in their design, and procured a sentence which condemned him to be deposed from his episcopal dignity. Paul refused submission to the decree of the council, and retained possession of the house of the church, and was supported in this step both by the protection of Zenobia, and the good will of the people. When that princess was driven from Antioch, Paul's enemies petitioned the emperor Aurelian to expel him, with whose request he complied in the year 272 or 273. What became of Paul after this event is not known; it has been thought by some writers, that those who adhered to him were formed into a separate society by Lucian, who suffered martyrdom in the year 312. There is no doubt that Paul was author of some publications that have not come down to our times, because his adversaries say that there was scarcely a page in his works without citations out of the Old and New Testament. According to the judicious and candid Lardner, who formed his judgment after much consideration, Paul had a great mind, with a mixture of haughtiness, and too much affectation for human applause. He was generally well respected in his diocese, and by the neighbouring bishops, in esteem with the great, and beloved by the common people. He preached frequently, and was a good speaker. Lardner's *Credibility*. Mosheim's *Ecc. Hist.*

PAUL I. pope, was a native of Rome, and brother to his predecessor Stephen II. He became deacon of the Roman church, and in the year 752, Stephen sent him with rich presents to the king of the Lombards, in order to obtain confirmation of the treaty of peace in which that prince had entered with his predecessor pope Zachary. In this object he succeeded without much difficulty, and the king granted an extension of the term agreed on for forty years longer, that he might divert the pope from interfering with the design he had then formed, and soon after carried into execution, of subjugating the exarchate of Ravenna. Upon the death of Stephen in 757, the Roman people were divided about the choice of a successor, some declaring for the deacon Paul, and others for the archdeacon Theophylact. At length, after a vacancy of more than a month, the nobility, clergy, and magistrates, all zealously promoting the interests of Paul, the election was carried in his favour, and this is the only instance which occurs in the whole history of the popes, of two brothers being raised successively to the papal chair. No sooner had Paul secured his election, than he dispatched a messenger to Pepin, king of France, to acquaint him with his promotion, and to entreat his protection, and that of the French nation in general, for the temporal dominions of the church. He had the satisfaction of receiving from that prince, in answer to the letters by his messenger, the most friendly congratulations on his exaltation to the papacy, and the strongest assurances of his resolution to maintain St. Peter and his successors in the full possession and quiet enjoyment of what he had given them, and to employ

ploy for that purpose, if necessary, the whole force of the kingdom.

During the pontificate of Stephen II. Pepin had conquered from the Lombards some of their dominions, which he had bestowed on the Roman see by an instrument of donation, and compelled the king to confirm the grant. This donation raised the bishop of Rome to the rank of prince, and may be considered as the foundation of the temporal grandeur of the popes. As, however, the places which were to have been yielded up to the Roman see, had not been evacuated by the Lombards before the death of their king; Paul, as soon as he was ordained, made a demand of them from his successor Desiderius. This prince professed the utmost readiness to satisfy the pope; but alleging that the affairs of his kingdom engrossed all his attention, he requested that till these should be settled, his holiness would excuse him in not complying with his demand. Of this delay the pope complained in a letter to Pepin. Indeed, much of his time, during the whole of his pontificate, was occupied in writing to Pepin, or his two sons, letters of complaint against the emperor, and in endeavouring, by frequent legations, as well as by letters, to keep the French, the Greeks, and the Lombards, ever at variance. To counteract this policy, the emperor and the king of the Lombards made every effort to gain Pepin, and to persuade him to withdraw his protection from the pope, representing him to be a public incendiary, who, instead of striving to unite the Christian princes, made it his study to create divisions among them, with no other view than that he might aggrandize himself at their expence. Pepin, however, remained the steady friend of his holiness through life. Paul died in 767, after he had presided over the Roman church ten years and a month. He gave sufficient evidence of his piety, by founding or repairing numerous churches. Thirty-one of his Letters have come down to our times, of which twelve are inserted in the sixth volume of the Collect. Concil. and the whole are in the "Caroline Code," so called from Charlemagne, who himself formed the collection which was published by James Gretzer in the year 1613. Moreri. Bower.

PAUL II. pope, originally known by the name of Peter Barbo, was descended from an ancient family, and born at Venice in the year 1417. He was educated in the mercantile line, and was on the point of embarking with some property on board a ship, when he received intelligence that his maternal uncle had been promoted to the papacy under the name of Eugenius IV. He now thought there were good prospects opened to him in the church, immediately quitted his business for study, and though he made but little progress in literature and the sciences, he was, in the course of a very few years, preferred by his uncle to the archdeaconry of Bologna, the bishopric of Cervia in the Romagna, the office of apostolical protonotary, and in the year 1440 to the dignity of cardinal. By his address and obliging manners, he recommended himself to several succeeding popes, of whom Calixtus III. gave him the appointment of legate in Campania. While he continued a cardinal, men of all ranks and conditions had free access to him, and he made it his study to gratify, as far as lay in his power, all who applied to him. Upon the death of Pius II. in 1464, Barbo was chosen pope. As he was a handsome man, and extremely proud of his person, he intimated his intention of taking at his coronation the name of *Formosus*, but he was dissuaded from this design by the cardinals, and he chose the name of Paul II. One of the first public measures of Paul's government, was a declaration in favour of Ferdinand, king of Naples, against the family of Anjou; and as the

party of the latter had begun to revive in the kingdom, many of the barons being dissatisfied with the arbitrary government of Ferdinand, he sent a considerable body of troops to the assistance of that prince, who was thus enabled speedily to quell the insurgents, and to restore peace to the kingdom. At this period, when a sense of his obligations to Paul was yet fresh in the king's memory, the pope applied to him for the arrears of the tribute due from the kings of Naples to the papal see, which had never yet been paid either by himself or his father Alphonso. Ferdinand, however, refused, which had nearly caused a civil war, but the affair was accommodated, upon the king promising to pay what was in justice due to the apostolic chamber, whenever he conveniently could.

Among the departments of the Roman government one was filled by persons called abbreviators, whose business it was to abridge the bulls and letters of the pope. This employment Paul considered as useless, and discharged the persons who filled it, though most of them were men of great learning and abilities. In this number was the historian Platina, who represented to his holiness the injustice of dismissing them from offices which they had purchased, when not chargeable with any neglect of duty, without returning the money. This remonstrance offended the pope; but Platina went farther, and insinuated that he and his brethren would appeal to the kings and princes of Christendom, which so incensed the pope that he had him thrown into prison under charge of high treason. His sufferings were very great, and continued four months, before he could obtain his release; and even then Paul was not contented, and would not forgive the boldness with which the historian had dared to resist his injustice. In the year 1466, the pope had the mortification to hear of the ruin of one of his plans for maintaining the authority of the Roman see, by punishing offenders against its injunctions. In Bohemia the principles of John Huss had obtained a wide diffusion, and Podiebrad, the king of the country, had, from his accession to the crown, favoured those who espoused them, insisting that the sacrament should be administered to all communicants in both kinds. The pope, enraged at his conduct, not only excommunicated him, but caused a crusade to be preached all over Germany against this Christian prince, while the Turks were pursuing their conquests without opposition. The indulgences that were granted to those who took the cross, proved the means of speedily raising a numerous army, which, however, Podiebrad soon put to flight with great slaughter, and returned triumphant to Prague with a number of prisoners, exceeding that of his whole army. After the defeat, the pope contented himself with issuing his anathemas, declaring the king of Bohemia a rebel to the church, and incapable of holding any dignity whatever. During the following year Paul gave orders for arresting Platina, under the pretence of his being engaged in a conspiracy against his person and government; the historian nobly vindicated himself from the heavy charge, but the merciless tyrant, instead of releasing, ordered him to be put to the rack. He was accordingly tortured with the utmost cruelty, but it had no effect upon his mind. Many of his known friends, the most eminent characters of the time, were also arrested, and exposed to the same kind of treatment, to some of whom it proved fatal. Mr. Roscoe, in speaking upon this subject, says; "During the pontificate of Paul II., letters and science experienced at Rome a cruel and unrelenting persecution, and their professors exhibited in their sufferings a degree of constancy and resolution, which in another cause might have advanced them to the rank of martyrs. The imprisonment of Platina, who, on being arbitrarily deprived of a respectable office, to which

he was appointed by Pius II., had dared to thunder in the ears of the pope the dreaded name of a general council, might, perhaps, admit of some justification; but this was only a prelude to the devastation which Paul made among the men of learning, who, during his pontificate, had chosen the city of Rome as their residence. A number of these uniting together, had formed a society for the research of antiquities, chiefly with a view to elucidate the works of ancient authors, from medals, inscriptions, and other remains of art. As an incitement to, or as characteristic of, their studies, they had assumed classic names, and thereby gave the first instance of a practice, which has since become general among the academicians of Italy. While these men were employing themselves, in a manner that did honour to their age and country, Paul was indulging his folly and vanity in ridiculous and contemptible exhibitions; and happy had it been if he had confined his attention to these amusements; but on a pretext of a conspiracy against his person, he seized upon many members of the academy, which he was pleased to consider as a dangerous and seditious assembly, accusing them of having, by the adoption of heathen names, marked their aversion to the Christian religion." In the year 1467, the pope brought about a reconciliation between several states of Italy, which had taken up arms as auxiliaries to the opposite factions in Florence. Soon after this event the emperor Frederic arrived at Rome, in consequence of a vow, and was entertained with great magnificence by the pope; and they agreed, as a proper expedient to engage the Christian princes in a league against the Turks, that letters should be written, in their joint names, to princes and states of Christendom, inviting them to send their ambassadors to Rome, in order to treat about means for defending their faith. About the same time, Paul was instigated by his ambition to obtain possession of the city of Rimini, and he called in the Venetians to aid him in the project; but after an appeal to arms, the forces of the church and its allies were completely defeated, and Paul was at length compelled to accede to such terms as the conquerors thought proper to dictate. In 1471 the pope published a bull, by which he reduced the jubilee circle to twenty-five years, and thus accelerated the return of a most absurd and superstitious ceremony. To him, however, it was of little moment, as he died suddenly of an apoplexy, in July of the same year, after a pontificate of almost seven years. The historian Platina, who could scarcely be deemed an impartial judge, charges him with avarice and simony; with selling even bishoprics to the highest bidders. With respect to the former of these charges, that there was no solid foundation for it is quite clear from Platina's own account, who speaks of him as profuse in his expences in buildings; in entertaining distinguished personages; in relieving the poor and decayed nobility; in purchasing, at any price, jewels and precious stones to adorn the papal crown, and in exhibiting public shows for the entertainment of the Roman people. Mathieu, the historian of Lewis XI. says, that he was greedy of money, and little cared by what means he acquired it, but was too fond of pomp to hoard it up in his coffers. He created eleven cardinals during his pontificate, among whom were two of his own nephews, although he had, previously to his election, taken a solemn oath not to increase the number of cardinals, or introduce more than one promotion to that high dignity. Two of the letters of this pontiff are in the thirteenth volume of the Collect. Concil. and several others in the fourth volume of d'Archery's "Specilegium," and in Cherubini's "Bullarium Magnum." This pope met with a most zealous apologist in one of the ablest men of the last century, who published a work entitled "Paul II. Vita ex Codice Anglica Bibli-

otheca desumpta, præmissis ipsius Vindicis adversus Platina, aliosque Obtretractores," 1740. Moreri. Bower. Roscoe's Life of Lorenzo de Medici.

PAUL III. pope, originally called Alexander Farnese, was of Roman descent, from an ancient and noble family, and born about the year 1467, at Carino in Tuscany. He pursued his studies under the celebrated professors whom the Medici family had invited to Florence, where he was, at a very early age, distinguished by his application to, and proficiency in, the different branches of literature. By pope Innocent VIII. he was appointed apostolical protonotary, and by Alexander VI. he was advanced to the bishopric of Monte Fiascone, by whom he was, in 1493, raised to the dignity of cardinal, when he was but twenty-six years of age. He was warmly patronized likewise by Julius II., Leo X., and Clement VII. By the latter he was successively nominated to the bishoprics of Palestrina, Sabina, Porto, and Ostia. The same pope appointed him to the legation of Viterbo, and received important services from him during the time of his imprisonment. So highly did Clement estimate the character of Alexander, that when he was sensible that his end was approaching, he recommended him to the cardinals as the most worthy of the whole college to be his successor. The death of Clement happened on the 25th of September 1534, and on the 13th of October following, the thirty-four cardinals present in the conclave concurred unanimously in voting for the cardinal Farnese. To this unanimity two circumstances contributed: one was his having arrived to the advanced age of sixty-seven, and the other the general belief that his constitution was broken up.

At the coronation the new pope assumed the name of Paul III., and the first object to which he directed his attention was to crush the progress of the Reformation, which he foresaw was pregnant with ruin to the authority and interests of the papal see. He was, like his predecessor, enraged at the innovations in Germany, and equally averse from any scheme for reforming either the doctrines of the church, or the abuses of the court of Rome. (See LUTHER.) At the same time he concluded an alliance with the emperor Charles V. and the Venetians against the Turks, and is said to have entertained such confidence of ultimate success, that he even made a partition of the Turkish empire with his allies. This object, as well as the extirpation of heresy, he had much at heart, but he considered peace between the emperor, and the king of France, who were then at war, to be an essential preliminary to both. He accordingly proposed an interview between the two monarchs at Nice, and offered to repair thither in person, that he might act as mediator in composing all differences. After long negotiations, he prevailed upon them to sign a truce for ten years, and in the mean time to send ambassadors to Rome to discuss their pretensions at leisure. During the private conference of the pope with the emperor at their interview, a marriage treaty, which had been some time negotiating, was concluded between Octavio Farnese, the pope's grandson, and Margaret, the emperor's natural daughter, and the widow of Alexander de Medici, who had been lately murdered by one of his own family. Soon after Paul's return to Italy, he dispatched cardinal de Medici with a grand retinue to Florence, who conducted the princess to this city, where he was received by the pope, the cardinals, and the Roman nobility, and the nuptials were celebrated with extraordinary pomp and magnificence. In the year 1538 the pope thundered out his bull of excommunication against king Henry VIII. of England, by which the monarch was deprived of his kingdom, his subjects were absolved from their allegiance, and the whole island laid under an interdict. But Henry's power was not to be thus shaken,

shaken, and the insolence of the pope only stimulated the king to imitate his tyranny, by persecuting all, without distinction, who refused to renounce the papal supremacy, and acknowledge his own. The year 1540 was rendered memorable by the establishment of the order of the Jesuits, and about the same time different diets were held in Germany for the purpose of terminating the religious disputes, and the divisions arising from them among the members of the empire, the result of which was various concessions to the Protestants, which suspended all prosecutions carried on against them in the imperial chamber, and left them in the full possession of the privileges which they had ever enjoyed. These proceedings gave great offence to the pope, who complained of them. During an interview which he had with the emperor at Lucca in 1541, when he suggested various things relating to the proper method of putting an end to the disputes about religion, and to the extinguishing of those mutual animosities between that prince and the king of France, which threatened to break out again into open hostility. In the year 1542, Paul, finding it impossible to avoid any longer calling a general council, sent John Morone, bishop of Modena, to announce to the diet of the empire at Spire, his determination of assembling such a council without delay, and to propose that Trent should be the place of its meeting. This proposal met with the approbation of the Catholic princes of the diet, but the Protestants totally objected to it. Without taking any notice of their opposition, Paul immediately published a bull, nominated three cardinals to preside as his legates, and fixed the day for opening the council, which was on the first of the following November. His legates repaired to Trent at the time appointed, where they remained several months; but as no persons appeared there, except a few prelates from the ecclesiastical states, the pope recalled them and prorogued the council. Having learnt, about this time, that the principles of Luther met with a favourable reception in many parts of Italy, he appointed a congregation of six cardinals, with full power to act as inquisitors of the faith at Rome. He also instigated the emperor to attempt the introduction of that tribunal into the kingdom of Naples, but the design was frustrated by the spirited opposition of the Neapolitans, of all ranks and conditions, who flew to arms upon the first step that was taken towards carrying it into execution, and obliged the viceroy to drive out of Naples all who belonged to that bloody office. During the summer of this year, the pope, with a view to the aggrandizement of his family, knowing the emperor's great want of money to carry on his war against France, offered him 150,000 ducats, if he would bestow the duchy of Milan on his grandson, Octavio Farnese, which proposal the emperor rejected. Paul now returned home greatly mortified, and his ill humour was not a little increased by the information, that the emperor had courted the Protestants, and granted them extraordinary indulgences at the diet of Spire, in order to secure their concurrence with the other members of the diet, in declaring war against France in the name of the empire, and granting extraordinary aids in troops and money: he also learnt that Charles had contracted an alliance with the excommunicated heretic, Henry VIII. of England. In the year 1545 the pope summoned the council of Trent to assemble anew in the month of November, but before that meeting the emperor gave the Protestants reason to suspect his hostile intentions against them; and he and the pope being intent upon one common object, *viz.* the suppression of the reformers, they mutually sacrificed to it their emotions of jealousy or resentment, that they might the more effectually pursue what each deemed to be of

greater importance. Still, however, Charles contrived to amuse the Protestants with professions of his pacific and favourable intentions towards them, and employed every art to quiet their fears and jealousies, though events soon occurred which convinced them of his perfidy. On the 13th of December 1545, the general council was opened at Trent, though as yet only twenty-five bishops had arrived, and these were Italians or Spaniards. Such was the first appearance of an assembly of men, who assumed authority as representatives of the universal church, and proceeded to determine the most important points of doctrine in its name. (See TRENT.) The council shewed an eagerness in condemning the opinions of the Protestants, which was soon followed by a striking instance of the pope's resolution to punish those who embraced them. The appeal of the carons of Cologne against their archbishop having been carried to Rome, Paul eagerly seized that opportunity of displaying his zeal for the established church, and as no person appeared in behalf of the archbishop, he was held to be convicted of the crime of heresy, and a papal bull was issued, depriving him of his ecclesiastical dignity, inflicting on him the sentence of excommunication, and absolving his subjects from the oath of allegiance, which they had taken to him as their civil superior. Charles now saw, that he should be soon obliged to declare openly, what part he would take in the business. At the same time, he was strongly urged to commence operations against them by the pope. At length he agreed to the proposals of the pontiff, who proud of having been the author of such a formidable confederacy against the Lutheran heresy, and happy in thinking that the glory of extirpating it was reserved for his pontificate, published the articles of his league with the emperor, and published a bull containing the most liberal promises to all who should engage in this holy enterprise. This war of religion commenced in 1546, and the papal troops, amounting fully to the number which Paul had stipulated to furnish, commanded by Octavio Farnese, the pope's grandson, assisted by able officers, formed in the long wars between Charles and Francis, seasonably joined the imperial army. Immediately upon hearing of the rapid success of the emperor's troops, the pope saw the danger that would result to him and his cause, from an extension of the imperial authority, and ordered his grandson to return instantly to Italy with all the troops under his command, while he recalled, at the same time, the licence, which he had granted for the appropriation of church lands in Spain to the emperor's use. He also foresaw, that if Charles acquired absolute power in Germany, he would become master of the council, should it continue to meet at Trent; for this reason he translated the council to Bologna. These circumstances occasioned a breach between the emperor and the pope, which was rendered irreparable by the assassination of the pope's son, Peter Lewis Farnese, one of the most odious tyrants that ever disgraced the world, and the loss of the city of Placentia, which had declared for the emperor. The pope instantly demanded satisfaction of the emperor for both injuries, but Charles eluded all his demands, and resolved to keep possession of the city together with its dependent territories. Paul would willingly have attacked the emperor by force of arms, but having in vain solicited the assistance of France and the republic of Venice, he was obliged to endure the injuries which his own weakness would not allow him to revenge. Various other causes of dispute occurred, and at length, in 1548, Charles resolved to terminate all differences by his famous system of doctrine, known by the name of the INTERIM, which see. Paul condemned the Interim in the strongest terms, and in a short

time after he dissolved the council, the weakness of whose measures had become the object of contempt to all Christendom. As the pope advanced in years, he grew more strongly attached to his family, and more jealous of his authority, but in the midst of his schemes for the aggrandizement of the latter, his grandson Octavio threatened to join the emperor, which so much irritated his holiness, that he was resolved to proceed against his relation with the utmost severity, from which, however, he was prevented by his death, which occurred in 1549, when he was in the eighty-second year of his age, and had held the Roman see more than fifteen years. It is difficult to appreciate the character of this pope. Cardinal Quirini has displayed much talent in defending his probity and general measures, while others represent him as a perfidious politician, whose great qualities were dissimulation and fraud; who was wholly intent upon raising his family, and ever ready to sacrifice the good of the church or state to the grandeur and interests of his illegitimate offspring. Besides his natural son, Peter Lewis, he had a natural daughter, named Constantia, who was married into the *Sforza* family, and their children, Alexander Farnese, and Guido Ascanio Sforza, he created cardinals soon after his election, when they had scarcely arrived to the years of manhood. He is said to have been well versed in most branches of literature, and a generous encourager of learned men. He wrote a commentary upon Cicero's "Epistles to Atticus" before his promotion to the pontificate, and after that period some to his friend Sadolet and to Erasmus, which have been applauded for the purity of the Latin style. Moreri. Bower. Mod. Un. Hist.

PAUL IV., whose former name was John Peter Caraffa, was the son of count Montorio, a nobleman of an illustrious family in the kingdom of Naples, and born in the year 1476. Being destined for the church, he from his early years applied to study with the greatest assiduity, acquired a profound skill in scholastic theology, and a considerable knowledge of the learned languages and of polite literature, the study of which had lately been revived in Italy. His mind, naturally gloomy and severe, was more formed to imbibed the spirit of the former, than to receive any tincture of elegance or liberality of sentiment from the latter; so that he acquired rather the qualities and passions of a monk, than the talents requisite for the conduct of the affairs of the world. When he was only eighteen years of age, he was made chamberlain to pope Alexander VI., and in the year 1504, pope Julius II. created him an archbishop. After this he was sent by the same pontiff as nuncio to Ferdinand, king of Arragon, when that prince took possession of the kingdom of Naples. In 1513 pope Leo. X. sent him in the same character to Henry VIII., king of England, at whose court he staid three years. Upon his return, he was appointed to other missions, but becoming disgusted with public life, he languished to be in a situation more adapted to his taste and temper, and having relinquished the paths of ambition, refused a valuable archbishopric, which was offered him by Charles V., and even resigned all his ecclesiastical preferments in the year 1524. He then retired to mount Pincio, where he instituted a new order of regular priests, whom he denominated *THEATINES*, and conformed himself to the rules which he had laid down for others who entered that body, preferring the solitude of a monastic life, with the honour of being the founder of a new order, to the highest dignities and greatest grandeur which the court of Rome could offer. In this retreat he continued many years, till pope Paul III., induced by the fame of his sanctity, called him to Rome, in order to consult him concerning the most proper and effectual means for

suppressing heresy, and re-establishing the ancient authority of the church. In 1536, the pope persuaded him to accept a cardinal's hat. He now shewed himself, what he had ever been in his heart, a bitter enemy to all innovation, and a furious zealot against Lutheranism. Upon the death of pope Marcellus II. in 1555, the conclave united in the choice of cardinal Caraffa, who was then at the advanced age of seventy-nine. At his coronation, out of gratitude to Paul III., he took the name of Paul IV. The Roman courtiers, from the known austerity of his character, anticipated a severe and violent pontificate, and that monastic manners would be substituted in the room of the gaiety and magnificence to which they had been accustomed. Paul, however, began his government by ordering his coronation to be conducted with greater pomp and ceremony than usual, and when he was asked in what manner he chose to live, he haughtily replied, as becomes a great prince. He used great pomp in his first consistory, when he allowed audience to the ambassadors of Mary, queen of England, who came to tender her obedience to the papal see, on which occasion he gave the title of a kingdom to Ireland. Afterwards, he insisted that all ecclesiastical possessions, which had been seized by Henry VIII., should be restored to the church, and that Peterpence should be immediately collected for the use of the Roman see. Having now attained to the highest dignity to which he could aspire, his principal object appears to have been the aggrandizement of his nephews; on the eldest, count Montorio, he bestowed the dukedom of Palliano; and on the second he conferred the government of Rome, with the title of marquis de Montebello; and the youngest, who had hitherto served as a soldier of fortune in the armies of Spain and France, he created a cardinal, and nominated him to the important legation of Bologna. The ambition of Paul's nephews was too great to be satisfied with the dignities to which they had been appointed. Their aims were directed to sovereign and independent establishments, which they had no prospect of obtaining but by dispossessing the emperor of some of his Italian dominions, and to attempt such an undertaking both Paul and his nephews were incited by motives of resentment as well as interest. Paul proposed an alliance offensive and defensive with the French king against the emperor, in which Henry VIII. joined as a party. Scarcely, however, had the treaty between the pope and the king of France been signed two months, before Henry forgot the obligations under which it laid him, and agreed to a truce with the emperor, who was upon the point of resigning all his hereditary dominions to his son Philip, and of retiring from the world. When the news reached Rome, that this truce was actually concluded, and sworn to by Henry as well as the emperor and his son, in Feb. 1556, it excited in the pope and his nephews the utmost astonishment and consternation. They now began to dread the vengeance, which, they were aware, they fully merited. Paul had recourse to intrigue and negotiation. He affected, as father of the church, to approve highly of the truce, as a happy expedient for putting a stop to the effusion of Christian blood, and he exhorted the rival princes to embrace the favourable opportunity of setting on foot a negotiation for a definitive peace, offering himself to be a mediator between them. Under this pretext he nominated cardinal Rebiba his nuncio to the court of Brussels, and his nephew, cardinal Caraffa, to that of Paris. The real design of the latter was to solicit the French king to renounce the treaty of truce, and to renew his engagements with the holy see; and he was commanded by his uncle to spare neither intreaties, nor promises, nor bribes, to gain his point. By the

the infliction of the pope war was renewed, and the imperial forces soon made their way to the gates of Rome. The pope now gladly sought a truce, which was granted first for ten, and then for forty days; during which, various felicities of peace were proposed, without any sincerity on the part of the pope. He had but one object in view, *viz.* the destruction of his enemies; and on the arrival of the French troops, he became more arrogant than ever, and banished all thoughts from his mind but those of war and revenge. Hostilities were again renewed, and with so much success against the cause of the church, that Paul, proud and obstinate as he was, found it necessary to accommodate himself to the exigency of his situation. He accordingly employed the mediation of the Venetians, and of Cosmo de Medici, in order to obtain peace; and so reasonable was Philip in his expectations, that though he had the pope at his feet, yet he allowed him to finish the war, without any detriment to the papal see. The conqueror, owing to his superstitious attachment to the church, appeared in the abject character of a humble suppliant, and acknowledged his error; while he who had been the most arrogant hypocrite, though completely vanquished, retained his usual haughtiness, and was treated with every mark of superiority. Paul now had leisure, and he applied that leisure to render his favourite tribunal of the inquisition a more efficient instrument for the eradication of heresy. With this view, he directed the inquisitors to draw up a catalogue of such books as were thought proper to be condemned, as impious and heretical. This *Index Expurgatorius* was published two years afterwards, and all were prohibited, under pain of excommunication, perpetual infamy, and other arbitrary punishments, from possessing any of the books mentioned in that catalogue. The pope likewise ordered the tribunal of the inquisition to take cognizance of several crimes, which before had been under the jurisdiction of the other courts; and he deservedly incurred universal odium, by being so active and diligent in his inquiry after criminals, that he quickly filled all the prisons of the inquisition. In the year 1558, the college of the electors of the empire having been assembled at Frankfort, the prince of Orange laid before them the instrument with which he had been entrusted by Charles V., containing his resignation of the imperial crown, and the transfer of it to Ferdinand, king of the Romans, which the college accepted and approved, and put Ferdinand in possession of all the ensigns of imperial dignity. When the new emperor sent his chancellor to acquaint the pope with this transaction, Paul declared all the proceedings at Frankfort illegal and invalid, as transacted without his authority, and refused to acknowledge Ferdinand as emperor so long as he lived. The same pretensions were maintained by him in the instance of queen Elizabeth of England, who announced to him by her ambassador that she had acceded to the throne: he haughtily declared that the kingdom was a fief of the holy see, and that she had no right to assume the crown without his leave. She nobly despised his claims, threw off the papal yoke, and, after the example of her father and brother, assumed, with the concurrence of parliament, the supremacy in all matters, ecclesiastical as well as temporal, within her dominions. The mortification which this event occasioned to Paul was increased by the intelligence which he received from his nuncio in Germany, that at the diet of Augsburg, in 1558, Ferdinand had confirmed the treaty of Passau, which established the peace of religion, and also the decrees of the subsequent diets. He was equally displeased with the peace concluded between France and Spain, since, by one of the articles, the respective sovereigns bound themselves to labour in concert for

procuring the convocation of a general council, in order to promote the reformation of the church, and to devise expedients for establishing unity and concord in the religious world. Shortly after this, the pope was very desirous of convincing the world, that he had sincerely at heart a correction of abuses in the church; and with this view, he ordered all bishops to proceed to their own dioceses, and all who had embraced a monastic life to return to their monasteries, admitting of no excuse whatever with regard to the last; and he executed his mandate with such severity, that many of the vagrant monks were imprisoned, and some of them sent to the galleys. Toward the close of life, he exhibited his impartiality in the punishment of crimes, by directing his severity against his nephews, who had, in many instances, abused the trusts reposed in them. He also suppressed some new and very unpopular taxes, which he pretended had been imposed without his knowledge. It was now almost too late to act upon a new course of practice; he was unable to remedy the evils of his administration, as he died in August 1559, in the 84th year of his age, and after a pontificate of little more than four years. Such had been his arrogance, tyranny, and oppressions, and he had rendered himself so universally the object of hatred, that when he was upon his death-bed, the Romans rose tumultuously, cursed his name and family, and then flying to the Capitol, struck off the head of a statue erected to him but three months before, which they dragged with a thousand insults through the public streets of the city, and at last threw it into the Tiber. The populace then crowded to the prison of the inquisition, forced open the doors, released several hundred prisoners, then set fire to the building, which was soon reduced to ashes, with all the papers and records of that court. An edict was then published for abolishing the arms of the Caraffa family, and in a single day there was not in all the city a memorial of them left. Paul was the author of a treatise, "*De Symbolo*;" another, "*De emendanda Ecclesia ad Paulum III.*;" besides the rules which his monastery was governed, entitled "*Regulæ Theatinorum*." Moreri. Bower. Robertson's Hist. of Charles V. Mod. Un. Hist.

PAUL V. pope, formerly called *Camillo Borghese*, was descended from a family of distinction at Sienna, and born at Rome in 1552. He was educated to the profession of the law, took the degree of doctor, and acquired such reputation for his knowledge of it, that he was made referendary of both signets. In 1588 pope Gregory XIV. appointed him to fill the important office of auditor of the chamber. By Clement VIII. he was promoted to the college of cardinals, and sent unccio to Spain; and on his return, the same pontiff nominated him his vicar, which is one of the four principal dignities in the Roman church. Upon the death of Leo XI. in 1605, he was unanimously elected pope, his vigorous age of fifty-three being the only objection brought forwards against him. At his coronation he took the name of Paul V., and almost immediately afterwards discovered his spirit of nepotism, by bestowing the cardinal's hat on Scipio Caffarelli, his sister's son; and by appointing his two brothers, Francis and John Baptist, to the important offices of governor of the Vatican, and governor of St. Angelo. No one of his predecessors exceeded this pontiff in zeal for advancing the ecclesiastical authority and jurisdiction of the papal see, or shewed himself more violent in endeavouring to execute his vengeance upon such as encroached upon his pretended prerogatives. His zeal in defence of the pretended rights and powers of his see was particularly displayed in the rash and unsuccessful contest into which he entered with the republic of Venice, in the year

year 1606. The Venetians had published several laws for restraining the licentiousness of the clergy, and for other purposes necessary for the well-being of their state, which the pope ordered to be rescinded. This they refused, and justified their conduct with great spirit. When Paul found that they opposed his demands, his fury was inflamed to the highest pitch. Having suffered himself to be publicly styled "Vice-God upon earth, the monarch of Christendom, and the supporter of papal omnipotence," he was resolved to keep up his character, by pouring down upon the republic the full weight of his vengeance. It was, however, to no purpose: the Venetians resisted, and carried their point; and, at the same time, they banished the Jesuits and Capuchins, who had thought proper openly to break the laws of the state, by obeying the pope.

About this time, the form of the oath of allegiance, required to be taken by Popish recusants in England, having been submitted to the consideration of the college of cardinals, they were unanimously of opinion that no true Catholic could take it with a safe conscience; upon which the pope dispatched a brief to this kingdom, prohibiting all Papists from submitting to it, and exhorting them patiently to endure all manner of persecution rather than comply. During the year 1609, an ambassador arrived at Rome, from the king of Congo in Africa, to request that the pope would send with him, on his return, learned missionaries to propagate Christianity in that country; but the death of the ambassador, soon after his arrival, occasioned that design to be postponed to some future time. In the same year, the pope received letters from the king of Persia, which were soon afterwards followed by an ambassador from the prince. These letters and this minister were supposed to have been sent at the instigation of some of the king's Armenian subjects, who had embraced the Catholic creed, with a view to procure arrangements for their benefit. In the year 1610, Paul was earnestly solicited to enter into a defensive alliance with the king of France and the princes of Italy, which he declined, lest he should thereby be involved in war. While the subject was in agitation, intelligence arrived at Rome of the assassination of Henry IV., at which his holiness expressed great sorrow, and assisted personally at his obsequies, which were celebrated with much solemnity at Rome. In 1614 the pope received information that a treaty was negotiating between the king of Great Britain and the queen-regent of France, for a marriage between the prince of Wales and her second daughter, Christina: he ordered his nuncio at the French court to remonstrate against the proposed alliance, as prejudicial to the church. Another subject on which he ordered his nuncio to remonstrate was a decree of the parliament of Paris, condemning a treatise of Suarez, a Jesuit, which justified the murder of Henry IV., and of heretical kings in general, of which, to his disgrace, the pope had declared his approbation, to be burnt by the hands of the common hangman. This decree he complained of, as an infringement on the privileges of the holy see, which reserved to itself the power of judging and determining concerning the tendency of such works; and he demanded satisfaction, by the formal annulling of the decree: but he could obtain no other satisfaction than the suspension of its execution. He met with a similar mortification, in an unsuccessful endeavour which he made to prevail with the states of France to order the publication of the decrees of the council of Trent. In the course of the following year, Paul's attention was chiefly engaged by the old controversy between the Franciscans and Dominicans, concerning the *immaculate conception of the Virgin Mary*. Shortly after this, he was involved in a dispute with the

court of France, which demanded the estates of the marshal d'Ancre at Rome, for the use of the French king. A compromise was agreed upon between the contending parties: more than half was given to Lewis XIII., and the remainder was allowed to the pope towards the building of St. Peter's church. In the year 1619 the pope published an universal jubilee, in order to implore the assistance of the Almighty for the defence of the church, which was endangered by a general insurrection of the Protestants of Bohemia, and other countries under the Austrian dominions, who had been provoked to fly to arms by the oppressions with which they were harassed. The pope sent assistance in money to the emperor, who, in the course of the following year, gained a decisive victory, which obliged the insurgents to submit. Paul survived the news of this victory only a few months, and died at Rome in January 1621, in the 60th year of his age, after a pontificate of nearly 16 years. Paul V. was distinguished for talents and learning, and would have appeared to great advantage in the page of history, had he not suffered his ambition and furious zeal for the authority of the holy see to lead him into measures which he could not support, and had he not sacrificed the wealth of the state to the aggrandizement of his nephew, cardinal Borghese. As a friend to literature, he published a bull, commanding all the religious orders to maintain professors in the Hebrew, Arabic, Greek, and Latin languages. In adorning and beautifying the city with magnificent buildings, he is said to have rivalled Sixtus V. He extended and improved the Vatican palace and library. He built two magnificent palaces for his relations, one in the city, and the other without the walls; and in both he collected the most valuable works in sculpture and painting, and the finest monuments of antiquity that he could purchase. He brought water to several parts of the city, by aqueducts and subterraneous channels, some from places at nearly 40 miles distance; and he embellished the streets with a great number of fountains. He was likewise liberal in his charitable donations, and in his alms to the poor.

PAUL, *Father*, whose name, before he entered into monastic life, was Peter Sarpi, was born at Venice, August 14, 1552. His father followed trade, but with so little success, that on his death his family were extremely ill provided for. Peter was taken under the care of a maternal uncle, who, being himself a schoolmaster, cultivated the talents of his nephew with unwearied application. He soon shewed, by the turn of his mind, that he had a capacity adequate to the most difficult departments in literature, and having, at the age of thirteen, made himself master of school learning, he turned his studies to philosophy and the mathematics. He entered also on the study of logic under Capella of Cremona, who was of the order of the Servites, and in this order Peter Sarpi, notwithstanding the remonstrances of his friends, determined to enter himself. In 1566 he took the habit of the order, though at that time only fourteen years of age, a period of life in most persons very improper for engagements of this nature, but in him attended with such maturity of thought, and in such a settled temper, that he never seemed to regret the choice he then made, and which he confirmed by a solemn public profession in 1572. At a general chapter of the Servites, held at Mantua, Paul, for he had now assumed that name, being but twenty years of age, distinguished himself so much in a public disputation by his genius and learning, that William, duke of Mantua, a great patron of letters, solicited the consent of his superiors to retain him at his court, and not only made him public professor of divinity in the cathedral, and reader of divinity and the canon law in that city,

city, but honoured him with many proofs of his esteem. The honours and bustle of a court did not accord with his temper and disposition; he quitted it two years afterwards, and retired to his beloved privacy. He was at this period but twenty-two years of age, and was intimately acquainted not only with the Latin, Greek, Hebrew, and Chaldee languages, but with philosophy, the mathematics, canon and civil law, and all parts of natural philosophy and chemistry that were then pursued by men of science. He now took priest's orders, and was distinguished by the illustrious cardinal Borromeo with his confidence, and employed by him on many occasions, which excited the enmity of his contemporaries, who, jealous of his celebrity, and having nothing to urge against his conduct, charged him with denying that the Trinity could be proved from the first chapter of Genesis: the Inquisition, however, before whom the accusation was brought, thought the charge too ridiculous to be attended to for a moment. After this he passed successively through the dignities of his order, of which he was chosen provincial for the province of Venice at the age of twenty-six years; and he discharged this post with such honour, that in 1579 he was appointed, with two others, to draw up new regulations and statutes for his order. He performed this business with much success, and when his office of provincial was expired, he retired for three years to the study of natural and experimental philosophy and anatomy, in which he made many important discoveries. Aquapendente, the famous anatomist, says that he was indebted to father Paul for his knowledge of the principles of vision, and there are pretty good proofs that he was not unacquainted with the circulation of the blood. He was now chosen procurator-general of his order, and during his residence at Rome was greatly esteemed by pope Sixtus V., and contracted an intimacy with cardinal Bellarmine and other eminent persons.

His enemies were still on the alert, and accused him of having written a letter in cyphers, which they explained, and said the true meaning was, that he hated the court of Rome, in which preferment was not to be obtained but by dishonest and corrupt means. This accusation was passed over, but not forgotten, and it made such impression on that court, that he was afterwards denied a bishopric by Clement VIII. He now retired from public life, and spent much of his time in studies devoted to practical piety. The most active scene of his life began about the year 1615, when pope Paul V. exasperated by some decrees of the senate of Venice, that appeared to him to interfere with the rights of the church, laid the whole state under an interdiction. Both parties having proceeded to extremities, employed their ablest writers to defend their measures. On the pope's side, among others, cardinal Bellarmine entered the lists, and with his confederate authors, defended the papal claims with great scurrility of language, and very sophistical reasonings. On this occasion father Paul was most eminently distinguished by his "Defence of the Rights of the Supreme Magistrate;" his "Treatise of Excommunication," and other writings; for which he was cited before the Inquisition at Rome, but he thought it prudent not to obey the summons. He was still pursued with unceasing activity by the agents of the pope, and one night, six months after a pretended accommodation had taken place, he was attacked by five ruffians armed with stilettoes, who gave him no less than fifteen stabs, three of which wounded him in such a manner, that he was left for dead. The assassins fled for refuge to the nuncio, and were afterwards received into the pope's dominions. It has been said, on good authority, that they were pursued by the

justice of heaven, and that all, except one man, who died in prison, perished by a violent death.

On his recovery he retired to his convent, where he employed himself in writing the "History of the Council of Trent," which bishop Burnet regards as the completest model of historical writing ever produced. Another writer considers it as equivalent to any production of antiquity, in which, he says, "the reader will find liberty without licentiousness, piety without hypocrisy, freedom of speech without neglect of decency, severity without rigour, and extensive learning without ostentation." In this and other works of less importance he spent the remainder of his life, till the beginning of the year 1622. when he died. As his end was evidently approaching, the brethren of his convent came to pronounce the last prayers, with which he could only join in his thoughts, being able to articulate no more than these words, "Esto perpetua," which were understood to be a prayer for the prosperity of his country. At his death he had attained to his 71st year, hated by the court of Rome and its adherents as their most formidable enemy, and honoured by all the learned for his abilities, and by the good for his integrity. His detestation of the corruption of the Roman church appears in all his writings; but there is a passage in one of his lectures frequently referred to on the subject, which we shall transcribe. "There is nothing more essential than to ruin the reputation of the Jesuits. By the ruin of the Jesuits, Rome will be ruined; and if Rome be ruined, religion will reform itself." Father Paul was buried with great pomp at the public charge, and a magnificent monument was erected to his memory.

PAUL, emperor of Russia, son of Peter III. and Catharine II. was born in 1754. He was brought up by his mother, and estranged by her from all public affairs. In 1773 he was married to the daughter of the landgrave of Hesse Darmstadt, who died two years afterwards. In 1776 he took for his second wife a princess of Wirtemberg Stutgard, niece to the king of Prussia, and in 1780 he made the grand tour of Europe. His desire of serving in the war of 1787 against the Turks was thwarted by his mother, and he continued to reside with his family at his palace with a few favourites. The sudden death of Catharine, in November 1796, made him master of a vast empire, for the government of which he was neither fitted by nature nor education. Catharine had never admitted him to any participation of power, and kept him in a state of almost total ignorance of the affairs of government. Although by birth he was generalissimo of the armies, president of the admiralty, and grand admiral of the Baltic, he was never permitted to head even a regiment, and was interdicted from visiting the fleet at Cronstadt. From these circumstances, it is evident that the empress either had conceived some jealousy of her son, or saw in him a mental imbecility that appeared to her to disqualify him for the arduous concerns of government. He was, however, not without qualities valuable in a sovereign. He had a strong attachment to justice, with an openness and frankness which rendered him accessible to truth when properly presented to him. His general intentions were good, though not unfrequently warped by prejudice and caprice.

It was commonly believed, that a short time before his death, Catharine had taken measures to exclude Paul from the succession, and to introduce Alexander in his stead. The plan, however, did not succeed, and Paul, on the day following his mother's death, made his public entry into St. Petersburg, amidst the acclamations of the people. Paul began his reign with breaking the power of the guards,

In many respects he shewed himself hostile to the memory of his mother, and it was probably in that spirit that he caused solemn obsequies to be performed for his unfortunate father, compelling the principal agents in his assassination to assist in the ceremonial. He abolished many of her institutions, and displayed the same restless desire of change that she herself had possessed. Trifling alterations in the dress and accoutrements of the soldiery, and the detail of military tactics, continued to occupy his attention. "Every day," said a bystander, "in the court of the palace, in a plain deep green uniform, great boots, and a large hat, he spends his morning in exercising his guards. Surrounded by his sons and aides-des-camps, stamping his heels on the pavement to keep himself warm, his bald head bare, his snuff nose cocked up to the wind, one hand behind his back, and with the other raising and falling his cane, in due time, and crying one, two; he prides himself in braving a cold of fifteen degrees of Reaumur without furs."

Soon after his accession, he gave an asylum to Lewis XVIII., and assigned him a large tract of land for his maintenance; and in order to prevent the spread of free inquiry, or, as he said, the spread of revolutionary principles, he laid the press under the most rigorous restrictions, and abolished the schools for the instruction of the lower classes, which Catharine had established. In 1798 he determined to employ his arms for the restoration of the ancient government of France, and in consequence of a treaty between him and the emperor of Germany, a Russian army of 45,000 men, under field-marshal Suvaroff, joined the Imperialists in the Austrian territories in Italy. They penetrated into Switzerland in 1799, and at first obtained great success, carrying all before them; but want of proper co-operation and plan at length defeated their purpose, and Suvaroff, in the autumn of the same year, led back the remainder of his army. Paul, in great rage, gave his faithful commander a very ungracious reception, and he threatened to withdraw from a confederacy, which he charged with failure in its engagements. The honour of grand master of Malta, conferred upon him, induced him, in the following year, to renew his exertions; but during the course of it his politics changed, he refused farther subsidies from England, and entirely seceded from the alliance. Scarcely had he deserted the allies, when he became out of humour with the British court, which had taken possession of Malta, and his next political object was to form a new maritime confederacy in the north, for the purpose of enforcing the claim of neutrals to a free navigation. He engaged Sweden and Denmark in the cause, and in the winter of 1800, he laid an embargo upon all British ships in his ports, confining the commanders, and sending the seamen to a distance up the country. At this period he seemed to have entered into the French interest; but despotic power, joining with strong passions and weak intellects, had now brought him to a state of capricious folly, little removed from insanity. He was perpetually making regulations of the most absurd and troublesome kind. Their general spirit was the maintenance of absolute authority in all its rigour, and the profoundest respect for the imperial dignity; but no one could less inspire it by his person and manners. Though not without a degree of generosity and good nature, the indulgence of his ungoverned caprice was daily converting him into a brutal tyrant, like some of the worst emperors of Rome. While accounts of his strange proceedings were circulating throughout Europe, he himself caused to be inserted in the Petersburg court gazette, "That the emperor of Russia, finding that the powers of Europe can-

not agree among themselves, and being desirous to put an end to a war which has desolated it for eleven years, intends to point out a spot, to which he will invite all the other sovereigns to repair and fight in single combat, bringing with them as seconds and equires, their most enlightened ministers and able generals, such as Thurgot, Pitt, Bernstorff, and that the emperor himself proposes being attended by generals count Pahlen and Khutof." This paragraph was immediately copied or translated into all the public papers, and it was said by many, that it was the composition of Paul himself, which has since been confirmed by Kotzebue, who was employed by the emperor of Russia to translate the original into the German language, for the express purpose of its being inserted in the Hamburg gazette. This folly was, in general, regarded as so decisive a proof of derangement, that the public was prepared to expect one of those revolutions to which the throne of Russia is peculiarly liable. Accordingly, on the night of March 22, 1801, Paul was found dead in his bed, and though it was currently reported that he was cut off by a stroke of apoplexy, it was soon generally known that he had been assassinated in the dead of the night, and that the perpetrators of the horrid deed had retired from the palace without the least molestation, and returned to their respective homes. As soon as the fact was discovered, medical assistance was called in, with the hope of restoring what might be only suspended animation; but these attempts proved fruitless. At seven o'clock, on the morning of the 23d, the intelligence of the death of Paul, and the succession of the grand duke Alexander, were announced to the people. By eight o'clock the principal nobility had paid their homage to the new emperor, who was solemnly proclaimed. Paul died in the 47th year of his age, and the fifth of his reign, leaving two sons, of whom Alexander, the eldest, succeeded him.

PAUL WARNEFRID, or, as he is often called, Paul the deacon, an eminent historian of the middle ages, was born of Lombard origin in the eighth century, at Ciudad del Friuli. He was educated in the court of Rachi, king of the Lombards, and afterwards ordained deacon of Aquileia. Desiderius, the last king of the Lombards, invited him to his court, employed him as a notary or secretary, and raised him to the posts of counsellor and chancellor. After the kingdom of Desiderius was overthrown, and the monarch made prisoner by Charlemagne in 774, the private history of Paul becomes obscure, and it is very differently related by different biographers. It is generally supposed that he first retired to his native country of Friuli, and that after the overthrow and death of Rodgauso, duke of that province in 776, he took the monastic habit. By some means his literary merit became known to Charlemagne, who took him into France, and perhaps employed him in his plans of promoting learning in his dominions. He was well acquainted with the Greek and Latin languages, and instructed in the former those clergymen who were selected to accompany the emperor's daughter, Rotrude, to Constantinople, where she was united to the son of the empress Irene. A remaining attachment to his sovereign Desiderius subjected Paul to the suspicions of some designs in his behalf, on which account he was banished; and he would probably have undergone the loss of his hands, or of his eyes, had not Charlemagne been unwilling to disable so eloquent a writer. It is farther supposed that he escaped from his banishment, and took refuge in the court of Arigiso, prince of Benevento; and that on the death of that prince in 787, he retired to the celebrated monastery of Monte Casino, where he ended his days, but at what time is

not known, though it is thought about the year 799. He was a considerable writer: his Latin poetry may rank with the best of that period: it consists chiefly of hymns, of panegyrics of saints and eminent personages, and other short pieces. One of the most interesting is an elegy addressed to Charlemagne, in order to obtain the liberty of a brother who was brought prisoner into France after the defeat of Desiderius. Of his prose writings the most valuable is entitled "De Gestis Longobardorum," in six books, which is the only history of that nation which we possess: and it contains facts that can no where else be found, and affords some curious views of rude society. Several editions of it have been published, and Muratori has inserted it in his great collection of the Italian historians. Paul likewise contributed to the Roman history entitled "Miscella," in which he was the continuator of Eutropius. He also wrote an abridged history of the first bishops of Metz, and other pieces of ecclesiastical biography, and made a collection of homilies by the order of Charlemagne. Gen. Biog.

PAUL, *St.*, in *Geography*, a town of France, in the department of the Tarn, and chief place of a canton, in the district of Lavaur. The place contains 906, and the canton 6070 inhabitants, on a territory of 170 kilometres, in 14 communes.

PAUL, *St.*, a town of Brasil, in the captainship of St. Vincent. It is a kind of independent republic, composed of the banditti of several nations, who pay a tribute of gold to the king of Portugal. It is surrounded by inaccessible mountains and thick forests. S. lat. $23^{\circ} 25'$. W. long. $45^{\circ} 52'$.—Also, a government of the same name, situated to the W. of Rio Janeiro: the principal productions are grain and cotton. The population is computed at 11,100 whites, 32,170 Indians, and 9000 blacks or mulattoes. (See PAULISTS.)—Also, a town of New Mexico, situated at the confluence of the two main head branches of the Rio Bravo.—Also, the most southerly of the Pearl islands, in the gulf of Panama. In a safe channel on the N. side there is a place for careening of ships.

PAUL, *St.*, a town of France, and principal place of a district, in the department of the Var; 7 miles W. of Nice. N. lat. $43^{\circ} 41'$. E. long. $7^{\circ} 11'$.—Also, a town of France, in the department of the Upper Vienne; 9 miles S.E. of Limoges.—Also, a town of France, in the department of the Lemane lake, on the lake of Geneva; 10 miles E. of Thonon.—Also, a town of the island of Bourbon.—Also, a town of France, in the department of the Gard; 10 miles N.E. of Uzès.—Also, a town of the island of Malta; 6 miles N.W. of Malta.—Also, an island in the Indian sea, N. of Amsterdam. It is overspread with shrubs and trees, and is said to abound with fresh water, but affords no good anchorage, nor any place of easy landing. S. lat. $37^{\circ} 51'$. E. long. $61^{\circ} 2'$.—Also, an island in the gulf of St. Lawrence; 9 miles N.E. from the N. cape of the island of Cape Breton.—Also, a river of Guinea, which runs into the Atlantic; 5 miles N. of Cape Mesurada.

PAUL'S Bay, *St.*, a bay on the N.W. coast of Newfoundland. N. lat. $49^{\circ} 50'$. W. long. $57^{\circ} 35'$.—Also, a bay on the W. coast of Newfoundland; 10 miles N.E. of Bonne bay.—Also, a bay on the N.W. shore of the river St. Lawrence, about six leagues below Cape Torment, where a chain of mountains, 400 leagues in length, terminates from the westward.

PAUL-de-Fenouillet, *St.*, a town of France, in the department of the East Pyrenées, and chief place of a canton, in the district of Perpignan; 28 miles W.N.W. of Perpignan.

PAUL-de-Omaguas, *St.*, a town of Brasil, in the government of Para, on the river Amazons. S. lat. $3^{\circ} 35'$.

PAUL *Trois Chateaux, St.*, a town of France, in the department of the Drôme, before the revolution the see of a bishop; 12 miles S. of Montelimart.

PAUL, an Italian coin, worth almost sixpence English. See PAOLO.

PAUL, in *Sea Language*, is a short bar of wood, or iron, fixed close to the capstern or windlafs of a ship, to prevent those engines from rolling back, or giving way, when they are employed to heave in the cable, or otherwise charged with any great effort.

PAULA, in *Geography*, a town of Naples, in Calabria Citra, at a small distance from the sea; 12 miles N.W. of Cosenza.

PAULA, *St.*, a small island of Russia, in the Frozen ocean. N. lat. $76^{\circ} 54'$. E. long. $103^{\circ} 14'$.

PAULA Gumda, in *Natural History*, a name given by the people of the East Indies to a species of fossil of the osteocolla kind, found in some springs, the waters of which are loaded with spar. These people used it in medicine, giving it in milk for gonorrhœas, and that with good success.

PAULADADUM, a name given by some authors to the medicinal earth of the island of Malta, called *terra Melitensis*, and *gratia sancti Pauli*. Some have given this name also to a species of white bole found in some parts of Italy, which is made into cakes, and sealed, and serves in the place of this and other white earths.

PAULAR, *EL*, in *Geography*, a town of Spain, in Old Castile; 11 miles E.S.E. of Segovia.

PAULARAH, a town of Hindoostan, in Berar; 25 miles N.W. of Chanda.

PAULASTYA, in *Hindoo Mythology*, is one of "ten lords of created beings," frequently alluded to in their sacred books under the name of Brahmadikas, or children of Brahma. Their names are enumerated under the article MUNI of this work, where, and in the articles referred to, some particulars will be found respecting them. Paulastya, or Palastrya, is also a name of Ravana, the ten-headed tyrant of Lanka, or Ceylon, against whom the wars detailed in the Ramayana were waged. See RAVANA.

PAULEY'S, in *Geography*, a town of America, in South Carolina; 8 miles S. of Kington.

PAULHAGUET, a town of France, in the department of the Upper Loire, and chief place of a canton, in the district of Brioude; 9 miles N.E. of Brioude. The place contains 982, and the canton 10,571 inhabitants, on a territory of 260 kilometres, in 22 communes.

PAULI, GREGORY, in *Biography*, a learned Polish divine, of the Protestant persuasion, was minister of the church of Wola, near Cracow, in the year 1555. He afterwards became pastor and senior minister of the church of Cracow, and was one of the earliest opponents of the doctrine of the Trinity in Poland, in behalf of the Arian hypothesis. For the freedom with which he avowed and defended his opinions in the pulpit, he was expelled from Cracow, when he retired to Racow, where he died at a great age, about the year 1591. He was author of "An Explanation of the difficult Passages of Scripture;" different treatises against the lawfulness of a Christian's undertaking offices of civil magistracy, or bearing arms; the first impression of the "Catechism of Racow," which was afterwards altered by Lælius Socinus, and Peter Statorius, and various pieces in the Trinitarian controversy.

PAULIANISTS, PAULIANISTÆ, in *Ecclesiastical History*, a sect of heretics, so called from their founder, Paulus Samosatenus, a native of Samosata, elected bishop of Antioch in 262.

His doctrine seems to have amounted to this: that the Son and the Holy Ghost exist in God in the same manner as the faculties of reason and activity do in man; that Christ was born a mere man; but that the reason or wisdom of the Father descended into him, and by him wrought miracles upon earth, and instructed the nations; and finally, that, on account of this union of the divine word with the man Jesus, Christ might, though improperly, be called God. It is also said, that he did not baptize in the name of the Father and the Son, &c. For which reason the council of Nice ordered those baptized by him to be re-baptized.

Being condemned by Dionysius Alexandrinus in a council, he abjured his errors, to avoid deposition; but soon after he resumed them, and was actually deposed by another council in 269.

PAULICIANS, a branch of the ancient Manichees, so called from their chieftain, one Paulus, an Armenian, in the seventh century: who with his brother John, both of Samofatena, formed this sect; though others are of opinion, that they were thus called from another Paul, an Armenian by birth, who lived under the reign of Justinian II. A certain zealot, called Constantine, revived, in the seventh century, under the government of Constans, this drooping faction, which had suffered much from the violence of its adversaries, and was ready to expire under the severity of the imperial edicts, and of those penal laws which were executed against its adherents with the utmost rigour. However, the Paulicians, by their number, and the countenance of the emperor Nicephorus, became formidable to all the East.

But the cruel rage of persecution, which had for some years been suspended, broke forth with redoubled violence under the reigns of Michael Curopalates, and Leo the Armenian, who inflicted capital punishment on such of the Paulicians as refused to return into the bosom of the church.

The empress Theodora, tutored by the emperor Michael, in 845, would oblige them either to be converted, or to quit the empire: upon which several of them were put to death, and more retired among the Saracens; but they were not all exterminated.

Upon this, they entered into a league with the Saracens, and, choosing for their chief an officer of the greatest resolution and valour, whose name was Carbeas, they declared against the Greeks a war which was carried on during this whole century, with the greatest vehemence and fury. During these commotions, some Paulicians, towards the conclusion of this century, spread abroad their doctrines among the Bulgarians: many of them, either from a principle of zeal for the propagation of their opinions, or from a desire of getting rid of the persecution and oppression they suffered under the Grecian yoke, retired, about the close of the eleventh century, from Bulgaria and Thrace, and formed settlements in other countries. The first migration was into Italy, from whence, in process of time, they sent colonies into almost all the other provinces of Europe, and formed gradually a considerable number of religious assemblies of persons, who adhered to their doctrine, and who were afterwards persecuted with the utmost vehemence by the Roman pontiffs. In Italy they were called Patarini, from a certain place called Pataria, being a part of the city of Milan, where they held their assemblies; and Cathari or Gazari, from Gazaria, or the Lesser Tartary. In France they were called Albigenes. The first religious assembly the Paulicians had formed in Europe, is said to have been discovered at Orleans, in 1017, under the reign of Robert; many of whom were condemned to be burnt alive.

The ancient Paulicians, according to Photius, expressed the utmost abhorrence of Manes and his doctrine. The Greek writers comprise their errors under the six following particulars. 1. They denied that this inferior and visible world is the production of the Supreme Being, and they distinguish the Creator of this world, and of human bodies, from the most high God, who dwells in the heavens: and hence some have been led to conceive, that they were a branch of the Gnostics rather than of the Manichæans. 2. They treated contemptuously the Virgin Mary, or, according to the usual manner of speaking among the Greeks, they refused to adore and worship her. 3. They refused to celebrate the institution of the Lord's supper. 4. They loaded the cross of Christ with contempt and reproach; by which we are only to understand, that they refused to follow the absurd and superstitious practice of the Greeks, who paid to the pretended wood of the cross a certain sort of religious homage. 5. They rejected, after the example of the greatest part of the Gnostics, the books of the Old Testament, and looked upon the writers of that sacred history, as inspired by the creator of this world, and not by the supreme God. 6. They excluded presbyters and elders from all part in the administration of the church. Mosheim's Eccl. Hist. vol. ii. 8vo.

PAULIEN, ST., in *Geography*, a town of France, in the department of the Upper Loire, and chief place of a canton, in the district of Le Puy. The place contains 2292, and the canton 5712 inhabitants, on a territory of 112½ kilometres, in 7 communes.

PAULINGSTOWN, or **PAWLING**, a township of America, in Dutchess county, New York, lying on the western boundary of Connecticut; containing 4269 inhabitants, of whom 34 are slaves.

PAULINSKILL, a river of America, in New Jersey, which runs into the Delaware, N. lat. 40° 54'. E. long. 75° 9'.

PAULINUS, PONTIUS MEROPIUS, or PAULINUS NOLANUS, in *Biography*, a celebrated prelate and ecclesiastical writer in the fifth century, was descended from a Roman patrician family, and born at the town now called Bourdeaux, in the year 353. He was a pupil of the celebrated Decius Ausonius, under whom he made a considerable progress in literature, and cultivated the study of rhetoric and poetry with success. Ausonius being called to Rome, Paulinus quitted his native place and followed him to that city, where he acquired much reputation as a pleader in the forum. He soon established for himself a character, and was raised while young to the consular dignity. Having married a Spanish lady named Therasia, he took leave of public affairs, and indulged his inclination for seeing foreign countries, visiting almost all the western provinces of the Roman empire. In the course of his travels he formed an intimacy with several Christians of high note, and was baptized by Delphinus, bishop of Bourdeaux, in the year 391. After this he went to Spain, and took up his residence at Barcelona; where he and his wife, having lost their only child, spent their time in devout contemplation and ascetic exercises, applying the greatest part of their property to benevolent and charitable purposes. In 393 he was ordained presbyter, having had the assurance that he should be allowed to go to Italy. During the following year he arrived at Rome, where he was treated with the utmost respect by all ranks, till perceiving the pope and clergy were growing jealous of his high reputation, he withdrew to a country house in the vicinity of Nola, in Campania. In 409, or perhaps sooner, he was ordained bishop of Nola. The early part of his episcopate was disturbed by the incursions of the Goths, who con-

quered and plundered the city of Nola; but he spent the remainder of his life in tranquillity, a bright example of piety, benevolence, and charity, and the object not only of veneration, but of delight, to persons of all ranks and parties. He died in 431, in the 78th year of his age. His works consist of "Letters" and "Poems," which are partly instructive, but chiefly of a lively and entertaining cast. They are correct, perspicuous, and elegant. The best edition of the works of Paulinus is that published at Paris in 1684, in two volumes 4to., the first of which contains his genuine pieces, the second such as are doubtful. Moreri. Gibbon, vol. v.

PAULINUS, an English bishop, who flourished in the early part of the seventh century, was called the apostle of Yorkshire, having been the first archbishop of York, a dignity that was probably conferred upon him about the year 626. He built a church at Almonbury, and dedicated it to St. Alban, where he preached to and converted the Brigantes. Camden mentions a cross at Dewborough, which had been erected to him, with this inscription, "Paulinus hic prædicavit et celebravit." At this period York was so small, that there was not so much as a church in it in which king Edwin could be baptized. Paulinus, it should seem, from Hume and others, was particularly patronized by Ethelburga, Edwin's queen. She is said to have made Christianity fashionable by her example; and her bishop, we are told, baptized 10,000 people in the river Swale. In Northumberland he baptized Segbert, king of the East Saxons. According to Bede, "Paulinus coming with the king and queen to the royal manor called Ad Gebrin, now Yevering, staid there 36 days, employed in the duties of catechizing and baptizing. In all this time he did nothing but instruct the people, who flocked to him from all the surrounding villages, in the doctrine of Christ and salvation; and after they were instructed, baptizing them in the neighbouring river Glen." He built some churches. See our articles LINCOLNSHIRE and NOTTINGHAMSHIRE.

PAULINUS, patriarch of Aquileia in the eighth century, and who is honoured by the Catholics with the title of saint, on account of his zeal in behalf of the doctrine of the Trinity, was a native of Germany. He is greatly distinguished by his laborious application, and zeal for the advancement of learning and science. By his erudition he recommended himself to the patronage of the emperor Charlemagne, who bestowed on him various substantial marks of his favour, and, towards the close of the year 776, promoted him to the patriarchate of Aquileia. From this time he became celebrated as a writer in defence of the Trinity. A complete edition of all his works, with learned notes and commentaries, was published at Venice in 1737, by John Francis Madrisi, a priest of the congregation of the Oratory. He died in the year 804.

PAULINZELLA, in *Geography*, a town of Germany, in the county of Schwartzburg-Rudolstadt; 8 miles W. of Rudolstadt.

PAULISTS, or as they are quaintly styled, *Mamelúcs*, a free-booting society of Brazil. Their town of *St. Paul* stands on a hill, about 150 paces in height, whence issue two rivulets, one to the S. the other to the W., which afterwards join, and fall into the Harcambu, that passes at the distance of a league to the N., a river full of fish, and capable of receiving large barks, but liable to inundations in the rainy season. On the N. of this river the mountains extend E. and W. for more than 40 leagues, while on the S.W. the chain seems to wind towards the mountains of Chiquitos in the Spanish possessions: the Parana passing with stupendous rapids of 12 leagues, the general breadth of the chain being

from 12 to 20. In the vicinity of St. Paul, the mountains present mines of gold of the purity of 22 carats, which is found in irregular masses, and in dust. The climate is benign, owing to the fresh air from the mountains, but the winter is cold and frosty. United by equal want of religion and morals, the first inhabitants of this town formed a republic, like that of robbers in a cavern. Malefactors of all nations and colours, Portuguese, Spaniards, Negroes, Indians, and all possible mixtures of mankind, formed about 100 families, which gradually rose to 1000. The Paulists declared themselves a free people; and they seemed to have merited the title in the worst sense of it, as they were completely free from all laws, morals, sentiments, and virtues: but they consented to pay the Portuguese a fifth part of the gold which they drew from the mines or scours (*lavaderos*). All strangers who did not bring certificates of having been regular thieves, were refused admittance into this hopeful colony; and there was a marked aversion from any multiplication of professions, as they rejected any robber who was at the same time a spy. The first trial of a new citizen, was to make an excursion, and bring in two Indians prisoners, to be employed in the mines, or in digging the grounds. Virtuous actions were carefully punished with death; and no citizen was permitted to retire from the society. Supplied with fire-arms from unknown quarters, they often descended the large rivers, carrying terror and destruction into the Spanish possessions in Paraguay; and an army would have been necessary ever to reduce them to the Portuguese domination. Where they suspected that force would not avail, they assumed the black gowns of the Jesuits, and preached with great fervour to the Indians, on the advantages of religion and civilization, and the heinous offences of robbery and murder, especially warning them against those devils the Paulists, who were accustomed to breakfast on nuns and little children. When they had catechized a sufficient number, they persuaded them to follow their teachers to a convenient spot, where they would find abundance of all the necessaries of life. The poor Indians, accustomed to the same procedure on the part of the Jesuits, allowed themselves to be conducted by these wolves in wool, who, when they had led them to the trap, seized and carried them off captives. This new mode of preaching began to disgust the savages; and the Jesuits found it difficult to avoid the total loss of their character, by the artifices of these new brethren, as the Indians could not possibly distinguish between a Jesuit and a Paulist. To the sword of the faith they were found to join that of the flesh, and to arm all their converts, not with patience but with fuses. The Paulists began to lose their advantages, both as preachers and as pirates; and the bonds of society having begun to be broken by the introduction of some virtues, the city was yielded to the Portuguese monarchy, which is still contented to receive a fifth part of the mines. Pinkerton's *Geog.* vol. iii.

PAULLINI, CHRISTIAN FRANCIS, in *Biography*, a physician and naturalist, was born at Eifenach, in Thuringia, in February 1643. He studied at the universities of Konigsberg, Copenhagen, Kiel, and Rostoch, was crowned poet at Hamburg, made master of arts at Wittemberg, and took the degree of doctor of physic at Leyden. After his graduation he pursued his travels, visiting Norway, Sweden, &c., and was prevented from extending his journey to Italy by sickness. He then settled in the practice of his profession, which he carried on at Hamburg, Altona, and in Holstein. He was honoured with the title of count palatine for his public services; and was appointed by the bishop of Munster to the offices of his first physician and historiographer. In 1689, however, he returned to Eifenach, where

he died in 1712, after having laboured under a palsy for seven years. He was a member of the academies Naturæ Curiosorum, and Ricovrati. He published a considerable number of works, chiefly monographs, or separate dissertations on subjects of natural history; such as his "Cynographia curiosa, seu Canis descriptio;" "Bufo breviter descriptus;" "Sacra herba, seu nobilis Salvia descripta;" "Tractatus de Anguilla;" "Talpa descripta;" "Lagographia curiosa;" "Lycographia;" "Onographia;" "De Jalappa, Liber singularis;" "Nucis Moscha:æ curiosa Descriptio," &c. He evinced in these papers an admiration of the marvellous, rather than of the useful; and the same may be said of his "Observationes Physico-Medicæ," which, however, contain some things worthy of attention. He likewise wrote "Theatrum illustrium Virorum Corbeizæ Saxonicæ," and some other works. Eloy Dict. Hist. Gen. Biog.

PAULLINIA, in Botany, so named by Linnæus in the first edition of his *Genera Plantarum*, in memory of the old Danish professor and physician Simon Paulli, who was born at Rostoch, in 1603, and died, if we mistake not, at Copenhagen, in 1680. He published in 1639, a Latin quarto, on Medicinal Plants, entitled *Quadripartitum Botanicum*; and in 1648 a thicker volume, in Danish, with wooden cuts, called *Flora Danica*, which however embraces the garden plants, as well as the native ones, known in Denmark at the time of its publication. He wrote also against Tobacco and Tea, and his work was translated into English by the late Dr. James, in 1746. The most remarkable circumstance attending it is his contending, with the positiveness usual to those who are in the wrong, that the Chinese Tea is no other than our European *Myrica Gale*; an error which Bartholin very cautiously and respectfully corrects, in his *Acta Medica*, v. 4. 1, where the true Tea is, not very accurately, figured.—Linn. Gen. 196. Schreb. 265. Willd. Sp. Pl. v. 2. 460. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 422. Juss. 247. Lamarck Illustr. t. 318. fig. 4, 5. Gærtner. t. 79. (Cururu; Plum. Gen. 34. t. 35.)—Clas and order, *Oleandria Trigynia*. Nat. Ord. *Tribilata*, Linn. *Sapindi*, Juss.

Gen. Ch. Cal. Perianth inferior, of five ovate, concave, spreading, permanent, unequal leaves. Cor. Petals four, obovate-oblong, twice as large as the calyx, furnished with claws; two of them more distant than the rest. Nectaries two; one of four oblong scales, inserted into the claws of the petals; the other of four glands at the base of the petals. Stam. Filaments eight, simple, shortish, connected at their base; anthers small. Pist. Germen superior, turbinate, three-sided, obtuse; styles three, thread-shaped, short; stigmas simple, spreading. Peric. Capsule large, turbinate, three-sided, of three cells and three keeled valves, the partitions from the central column. Seeds solitary, nearly ovate, each with a divided spongy tunic.

Ess. Ch. Calyx of five unequal leaves. Petals four. Nectaries of four scales and four glands. Capsule turbinate, of three cells, the partitions from the central column. Seeds solitary, with a cloven tunic.

Obf. Mr. Schumacher, in the third volume of the Copenhagen Transactions, has followed Plumier in making two genera of the Linnæan *Paullinia*, and he is followed by Willdenow. (See SERIANA.) He adopts the term *Samara* for the fruit of *Seriana*, which consists of three connected capsules, that do not burst, winged at their base, and whose nearly globose seeds do not seem to have any tunic. Such is the case in the true *Paullinia Seriana* of Linnæus, and several other species; but what Gærtner has figured for the last-named plant, is no other than the *barbadensis*, a true *Paullinia*. We know not whether Mr. Schumacher has found out this

mistake, as we have not seen his work, but must quote it on the authority of Willdenow, to whose fourteen species we add one hitherto non-descript, and two from Lamarck's Dictionary.

1. *P. nodosa*. Willd. n. 1. Jacq. Enum. Amer. 35. Obf. fasc. 3. 11. t. 62. f. 3.—Leaves ternate, obscurely toothed; the middle leaflet obovate. Footstalk without wings. Clusters longer than the leaves.—Native of South America. Jacquin never saw this but in a dried state, nor does it appear to have fallen in the way of any other botanist. He describes the stem as shrubby, climbing, round, unarmed, furrowed and smooth. Leaflets smooth on both sides, more or less unequally toothed, nearly sessile on their common stalk, which has no wing or border, obtuse, rather coriaceous, the middlemost nearly twice as large as the rest. Clusters six inches long, their common stalks woody, here and there tumid and knotty, the upper half bearing many scattered, branched, bracteated, many-flowered partial stalks; half an inch long.

2. *P. Cururu*. Linn. Sp. Pl. 524. Willd. n. 2. Jacq. ib. t. 61. f. 4. (Cururu scandens triphylla; Plum. Ic. 102. t. 111. f. 2.)—Leaves ternate, with tooth-like serratures. Footstalk winged. Clusters about as long as the leaves. Capsule pear-shaped.—Native of South America.—Stem climbing, with long, axillary, simple or divided tendrils. Footstalks two inches long, winged, entire, gradually dilated upwards. Leaflets longer, ovate, smooth, all nearly equal, with one central and many transverse ribs. Clusters axillary, many-flowered. Capsule with three blunt angles, and as many intermediate furrows.

3. *P. densiflora*.—Leaves ternate, obscurely serrated. Footstalk winged. Clusters aggregate, much branched, one-fourth as long as the footstalks.—Sent by Mutis from New Granada, to Linnæus, who never described it. The stem is triangular and furrowed. We perceive no tendrils. Leaves like the last, but broader and more elliptical, their lateral veins hairy on one side at their origin. Clusters hardly an inch long, downy, axillary, aggregate, repeatedly branched. Calyx hairy, as is likewise, in some degree, the obovate pointed capsule. Seeds large, polished, of a chestnut brown.

4. *P. caribagenensis*. Jacq. Obf. fasc. 3. 11. t. 62. f. 6. Willd. n. 3.—Leaves twice ternate, cut. Footstalks all winged. Stem without prickles.—Gathered by Jacquin about Carthage in South America. He describes the leaves as more deeply cut than in the rest, almost pinnatifid, and very thin, not at all coriaceous. The whole plant is without prickles.

5. *P. caribæa*. Jacq. ib. t. 62. f. 7. Willd. n. 4.—Leaves twice ternate, obtuse, slightly serrated. Partial footstalks winged; common one, like the branches, prickly.—Native of the Caribbee islands. Leaves smaller and blunter than those of the last, with slight and distant serratures; their common stalk beset with hooked prickles, which are also plentiful on the branches.

6. *P. curassavica*. Linn. Sp. Pl. 525. Willd. n. 5. Jacq. ib. 12. t. 61. f. 8. (Cururu scandens enneaphylla, fructu racemoso rubro; Plum. Ic. 101. t. 111. f. 1.)—Leaves twice ternate, pointed, bluntly serrated. Partial footstalks slightly winged. Valves of the capsules half-inversely-heart-shaped.—Native of Curaçoa.—The stem is unarmed, furrowed, with downy rusty angles, the furrows, in the upper part, as Schumacher well observes, marked with rusty dots. Leaves from four to six inches long, smooth, less coriaceous than usual, distant and coarsely serrated, the terminal leaflet large, tapering at each end. We have not seen the fruit.

7. *P. barbadensis*. Jacq. Enum. Amer. 36. Obf. fasc. 3. 12. t. 62. f. 9. Willd. n. 6. (P. Seriana; Gærtner. v. 1.

PAULLINIA.

381. t. 79.)—Leaves twice ternate, obtuse, coriaceous, nearly entire. Footstalks slightly winged. Valves of the capsule downy, half-ovate.—Native of the West Indies. The leaves are highly polished on their upper side, paler and opaque beneath, two or three inches long. Clusters on long stalks, each accompanied with a pair of tendrils. Capsules veiny, downy, of a rusty red, their valves much compressed, equally winged.

8. *P. polyphylla*. Linn. Sp. Pl. ed. 1. 366. (*P. foliis supra decompositis*; Linn. Hort. Cliff. 152. *Cordis indii folio et facie frutescens portoricensis*; Pluk. Phyt. t. 168. f. 5.)—Leaves doubly pinnate, ovate, cut. Footstalks winged, with hairy ribs. Angles of the stem fringed with spreading hairs. Flowers at the fork of the tendril.—Native of South America. The stem climbs by means of axillary tendrils, and has many angles, rough with dense spreading hairs, and separated by smooth furrows. The tendrils and footstalks are hairy in a similar manner, the latter all winged. Leaflets about half an inch long, ovate, more or less cut or lobed, sometimes tapering at the base, nearly smooth on both sides, with hairy ribs and edges. Tendrils about three inches long before they divide into two spiral smooth branches, at the base of which stands a small downy tuft of flowers. Of the fruit we can discover nothing, but Plukenet heard it was of a siliqueose kind, which term rather accords with *Paullinia* than with *Seriana*, and the close affinity of this species to the following, precludes all doubt of its genus. The great confusion which envelopes this species, could be dispelled only by the original specimen of Linnæus, who in the second edition of his Sp. Pl. confounded with it what is now properly called *Seriana tritenata*, Willd. Sp. Pl. v. 2. 466. A leaf of Plumier's figure, which belongs to this last, is actually copied by Jacquin, and cited by Willdenow, for *P. polyphylla*, of which Plukenet's plate above quoted is the only genuine representation we can discover.

9. *P. bipinnata*. Poiret in Lam. Dict. v. 5. 99. (*P. polyphylla*; Willd. n. 7?)—Leaves doubly pinnate, obovate, slightly notched at the summit. Footstalks downy, winged towards the end. Stem finely downy. Flowers at the fork of the tendril.—Gathered by Commerçon in Brasil. One of his specimens is before us, marked, with a doubt, *P. polyphylla*, Linn. and it appears to be what Schumacher, whom Willdenow copies, has actually described as such. This plant however differs essentially from the last, in the dense pubescence of its stem, as well as of its footstalks, and, though in a less degree, of the backs of its leaves, whose shape is obovate and obtuse, with two or three irregular shallow notches. The tendrils too are very much shorter and thicker, and their spiral branches are downy. Capsule near an inch long, downy, striated, its valves half-obovate, much compressed, abrupt and wavy at the summit.

10. *P. tetragona*. Aubl. Guian. v. 1. 355. Willd. n. 8.—Leaves once or twice pinnate, ovate, distantly serrated, smooth. Footstalks scarcely winged. Clusters compound, axillary, much shorter than the leaves. Valves of the capsule wedge-shaped, with a blunt terminal tooth.—Observed by Aublet at Cayenne. We have a specimen, gathered by Dr. Mærtner in the Caraccas, which accords as much as possible with our original one of Aublet, except that the former being in flower, the latter in fruit, with only one leaflet, an absolute decision can hardly be made. The leaves evidently appear by both specimens to be distantly toothed, though Aublet says they are entire, and he quotes Rumphius's *Funus quadrifidus*, v. 5. 4. t. 3, which is doubtless very different, except that the stem in both plants splits into four portions, serving to make baskets or cordage. The branches, tendrils, and common footstalk, in Mærtner's plant, are hispid with

prominent rigid hairs. The whole leaf is a foot long, of five pair of opposite leaflets, with an odd one; the lowest pair again pinnate, each of five leaflets, of which one is ternate; the second pair ternate, having small lateral leaflets; the rest all simple, full two inches long and one broad; the whole are reticulated with innumerable veins, and of a light green, smooth, except the midrib on the upper side. Flowers in compound, axillary, aggregate, slightly hairy clusters, three inches long, accompanied by many broad, ribbed, smooth, fringed bractes. Calyx downy at the edges and base, in both specimens. Capsule, in that of Aublet, near an inch long, narrower than in the last species, each valve crowned with a blunt tooth at the outer angle, the inside, and the central column, finely woolly.

11. *P. meliifolia* Poiret in Lam. Dict. v. 5. 99.—Leaves pinnate; leaflets ternate, pointed, toothed, downy beneath. Footstalks winged. Valves of the capsule slightly bordered.—Gathered by Commerçon at Brasil, according to Poiret. We find no specimen that answers to his description entirely. He compares the leaves to those of *Melia Azedarach*; but they are downy and rusty beneath. The clusters appear to spring from the division of the tendrils, as in N^o 8 and 9. The capsules are pear-shaped, a little rounded, stalked, marked at each suture with a short membrane "which originates from the upper part of the peduncle." This peduncle can only mean the stalk of the capsule or germen, not of the flower. M. Poiret contends that its border, or wing, is analogous to the remarkable one in *Seriana*, and hence he would keep the two genera united; but the valvular capsule is an important difference.

12. *P. Vespertilio*. Swartz Ind. Occ. v. 2. 695. Schumacher. Copenh. Transf. v. 3. p. 2. 122. t. 11. f. 1. Willd. n. 9.—Leaves pinnate, smooth, ovate, pointed, cut. Footstalk naked. Capsule with lanceolate horizontal wings.—Gathered by Mr. Masson in the island of St. Christopher. We have seen no specimen. Swartz says the stem is shrubby, round and smooth, climbing by means of axillary rigid tendrils, hardly so long as the leaves, which are pinnate, of two pair of leaflets with an odd one; their footstalks round, striated, without wings. Clusters axillary, simple, erect, shorter than the leaves, of many small whitish flowers. Capsules stalked, large, ovate, obtuse, three-sided, with three valves, terminated by three lanceolate, obtuse, thick, membranous, horizontal wings.

13. *P. pinnata*. Linn. Sp. Pl. 525. Willd. n. 10. Jacq. Obs. tasc. 3. 12. t. 62. f. 12. Gærtner. t. 79? (*Clematis pentaphylla*, pediculis alatis, fructu racemoso tricocco et cocineo; Plum. Amer. 76. t. 91. *Cururu scandens pentaphylla*; Plum. Gen. 34.)—Leaves pinnate, smooth, elliptic-lanceolate, pointed, bluntly serrated. Footstalk winged. Capsule pear-shaped, three-lobed.—Native of the West Indies, in dry sandy places, not unfrequent. The leaves are a span long, of two pair of shining veiny leaflets, with an odd one; their stalk rather broadly winged throughout. Clusters solitary between the branches of each tendril, downy; sometimes sessile and axillary, without a tendril. Fruit one inch and a half long, scarlet, with three furrows, according to Plumier, but no wings, the seeds black and polished, each with a white tender sweetish tunic. Gærtner represents it exactly obovate, without lobes or furrows, and the partitions opposite to the centre of each valve, which does not agree with Plumier, and we suspect he may have committed an error in this case, as well as with regard to *Seriana*; see our seventh species. Linnæus received from Browne's herbarium a Jamaica specimen, under the name of *P. pinnata*, which is certainly different from what we have described, having three pair of much smaller leaflets, the wing

of whose common stalk is greatly dilated at each side into a triangular form. For want of fructification, the genus is doubtful, but we take the plant to be a *Weinmannia*; perhaps a luxuriant branch of *W. pinnata*.

14. *P. tomentosa*. Jacq. Enum. Amer. 37. Obf. fasc. 1. 19. t. 10. fasc. 3. 12. t. 61. f. 13. Willd. n. 11.—Leaves pinnate, ovate, obtuse, wavy, downy on both sides. Footstalk winged. Capsules downy.—Native of South America, where it was discovered by Houffoun. The whole plant is clothed with short dense soft pubescence. Branches round. Leaflets broad-ovate, wavy or partly serrated, above an inch long, two pair, with a larger odd one, tapering at the base. Clusters from between the forks of the tendrils. Capsules turbinate, short, three-lobed. Linnæus had for this a totally different plant in the Upsal garden, with a large leaf, like a *Rhus*, to which his remark in both editions of Syst. Veg. refers. This has six pair of pointed serrated leaflets, with an odd one, and the upper half only of the common stalk is winged. Respecting the genus, nothing can be determined.

15. *P. cauliflora*. Jacq. Coll. v. 4. 176. Ic. Rar. t. 458. Willd. n. 12.—Leaves pinnate, ovate-lanceolate, entire, smooth; the lowermost pair ternate. Footstalk slightly winged. Flowers in dense axillary tufts.—Native of the Caraccas. It flowered at Vienna, in the stove, from October to January, but produced no fruit. The stem climbs, by means of tendrils, as in the other species. Leaves about six inches long, composed of one pair of ternate leaflets, two pair of simple, and an odd one, the latter near two inches long; all pale at the back. Flowers numerous, small, white, in sessile, round, dense tufts, either axillary, along with the cloven tendrils, or proceeding from various parts of the old leaflets stem.

16. *P. japonica*. Thunb. Japon. 170. Willd. n. 13.—Leaves pinnate, of four pair of three or five-cleft leaflets, with an odd one; the second pair ternate. Footstalks winged. Panicles opposite to the leaves. Stem herbaceous. Gathered by Thunberg in Japan, where it is called *Bak Ren*. "The stem is herbaceous, climbing, smooth, angular, without prickles, scarcely so thick as a straw. Leaves alternate, stalked, smooth; the lowest pair of leaflets nearly sessile, ovate, an inch long, cut into two or three entire segments; the next pair ternate, with a winged partial stalk, their lateral partial leaflets ovate, either undivided or cut, the middlemost three-cleft; the rest of the leaf pinnate, consisting of a bordered jointed stalk, two pair of oblong leaflets, in three or five segments, and a larger terminal one in three segments. The common footstalk resembles the stem, and is two inches long. Flowers paniced, opposite to the leaves. Common flower-stalks the length of the leaves; partial ones very short." Such is Thunberg's account, but as he says nothing of the fruit, and we have seen no specimen, the genus (whether *Paullinia* or *Seriana*) must remain in uncertainty.

17. *P. diversifolia*. Jacq. Enum. Amer. 36. Obf. fasc. 3. 12. t. 62. f. 14. Willd. n. 14.—Leaves doubly pinnate, obovate, obtuse, nearly entire. Footstalks winged. Stem round, nearly smooth.—Native of South America. As far as we can judge by Jacquin's description and figure, this ought to have been placed near *polyphylla* and *bipinnata*. The leaves are composed of obovate obtuse leaflets, about the size of the latter, (being scarcely, except the terminal ones, half an inch long.) but nearly smooth, almost always entire and undivided, and all their footstalks are winged, except the base of the general one. The first pair of divisions of the leaf are pinnate, of five leaflets, the second, third, and terminal ones are ternate, the last not larger than its neighbours. The stem is shrubby. Clusters accompanied by

tendrils, or rather, as we presume, springing from the latter at their division.

It appears to us that this genus, as well as its near relation *Seriana*, requires more accurate attention than either of them has yet received from botanical travellers. In our gardens they are now scarcely at all known, though some species of *Paullinia* were cultivated by Miller. S.

PAULMOW, in *Geography*, a town of Bengal; five miles N.W. of Curruckdeah.

PAULO, MARCO, in *Biography*, a celebrated traveller, son of Nicholas Paulo, a Venetian, who went with his brother Matthew, about the year 1225, to Constantinople, in the reign of Baudoin. While they were on this expedition Marco was born. On their return through the deserts, they arrived at the city where Kublai, grand khan of the Tartars, resided. This prince was highly entertained with the account which they gave him of the European manners and customs, and appointed them his ambassadors to the pope, in order to demand of his holiness a hundred missionaries. They accordingly came to Italy, obtained from the Roman pontiff two Dominicans, the one an Italian, and the other an Asiatic, and carried with them young Marco, for whom the Tartar prince expressed a singular affection. This youth was, at an early period, taught the different dialects of Tartary, and was afterwards employed in embassies which gave him the opportunity of traversing Tartary, China, and other eastern countries. After a residence of seventeen years at the court of the great khan, the three Venetians came back to their own country, in the year 1295, with immense wealth. A short time after his return, Marco served his country at sea against the Genoese, his galley in a naval engagement was sunk, and himself taken prisoner and carried to Genoa. He remained there many years in confinement; and, as well to amuse his melancholy, as to gratify those who desired it of him, sent for his notes from Venice, and composed the history of his own and his father's voyages in Italian, under this title, "Delle maraviglie del mondo da lui vidute," &c., of which the first edition appeared at Venice in 8vo. 1496. This work has been translated into several foreign languages, and has been inserted in various collections. The best editions are one in Latin, published by Andrew Müller at Cologne in 1671, and one in French, to be found in the collection of voyages published by Bergeron, at the Hague in 1735, in two vols. In the narrative there are many things not easily believed, but the greater part of his accounts has been verified by succeeding travellers. He not only gave better accounts of China than had been before received; but likewise furnished a description of Japan, of several islands of the East Indies, of Madagascar, and the coasts of Africa, so that from his work it might be easily collected that a direct passage by sea to the East Indies was not only possible, but practicable.

PAULO, in *Geography*, a town of South America, in New Granada; 25 miles E.N.E. of Tunja.

PAVLOGRAD, a town of Russia, in the government of Ekaterinoslav; 32 miles E. of Ekaterinoslav. N. lat. 47° 10'. E. long. 35° 54'.

PAVLOSK, a Russian fortress, in the province of Tauris, constructed for defending the straits of Taman, between the Black sea and the sea of Azoph; six miles S. of Kerch.

PAVLOV, a town of Russia, on the N. coast of the Tehudskoe lake; 20 miles S. of Narva.

PAVLOVA, a town of Russia, in the government of Irkutsk, on the Lena; 16 miles N. of Orlenga.

PAVLOVSK, a town of Russia, in the government of Voronez,

Voronez, on the Don; 68 miles S.S.E. of Voronez. N. lat. 50° 24'. E. long. 40 14'.

PAVLOVSKAIA, a town of Russia, in the government of Ekaterinoflav, on the Dnieper; 32 miles E. of Ekaterinoflav.

PAULUN, a town of Hindoostan, in the circar of Kitchwara; six miles S.E. of Raajegur.

PAULUS, CYRUS FLORUS, called *Paul the Silentiary*, because he was at the head of the royal silentaries, officers whose business it was to prevent noises in the palace, flourished in the sixth century, under the emperor Justinian. He is said to have been of an illustrious family, and possessed of hereditary opulence, but to have been still more distinguished for learning and eloquence. He was author of poems in the Greek language, among which was one giving the history and description of the church of St. Sophia in Constantinople in more than a thousand hexameter lines. This has come down to our times, and was published in the collection of Byzantine historians, with a translation and notes by Ducange. He also composed a poem on the Pythian Thermenæ, and some epigrams in the Anthology. See Gibbon, vol. vii. in which is a fine description of St. Sophia, taken partly from the work of Paulus.

PAULUS Hook, in *Geography*, a fortified post of North America, in Bergen county, state of New Jersey, on the North river, where the river is 2000 yards wide, opposite to the city of New York. In 1780 this river was so frozen, that carriages with heavy burdens passed over it.

PAUNCH, or PANCH, on *Ship-board*, a sort of thick and strong mat, formed by interweaving twists of rope-yarn as close as possible. See MATTS.

PAUNCHWAY, a small boat in Bengal, attendant on the *Budgerows*, which see. The paunchways move more expeditiously than the budgerows; but they are nearly of the same construction, with this difference, that the greatest breadth is somewhat further aft and the stern lower. We shall here add that another boat of this country, called "Moorpunkay," is curiously constructed; these boats are very long and narrow, sometimes extending to upwards of 100 feet in length, and not more than eight feet in breadth; they are always paddled, sometimes by 40 men, and are steered by a large paddle from the stern, which rises either in the shape of a peacock, a snake, or some other animal; the paddlers are directed by a man who stands up, and sometimes makes use of a branch of a plant, to regulate their motions, using much gesticulation, and telling his story to excite either laughter, or exertion. In one part of the stern is a canopy supported by pillars, in which are seated the owner and his friends, who partake of the refreshing breezes of the evening. These boats are very expensive, owing to the beautiful decorations of painted and gilt ornaments, which are highly varnished, and exhibit a considerable degree of taste.

PAUNDURA, in *Geography*, a town of Hindoostan, in Oude; 12 miles S.W. of Gazypour.

PAUNGARTENBERG, a town of Austria; six miles S.W. of Grein.

PAUNRAN, a town of Hindoostan, in Mohurbunge; 20 miles N. of Harriopour.

PAVO, PEACOCK, in *Astronomy*, a constellation of the southern hemisphere, unknown to the ancients, and not visible in our northern parts of the world, containing fourteen stars. See CONSTELLATION.

PAVO, in *Ichthyology*, a species of *Chatodon*, and also of *Labrus*; which see respectively.

PAVO, the Peacock, in *Ornithology*, a genus of birds of the order Gallinæ, of which there are four species, according

to Linnæus. The generic character is, bill convex, robust; the head is covered with feathers turned back; the nostrils are large; the feathers of the rump long, broad, expansile, and covered with rich eye-like spots.

Species.

CRISTATUS; Crest Peacock. Of this species there are three varieties, viz. 1. Head with a compressed crest; spurs solitary. 2. Cheeks, throat, belly, and wing-coverts, white. 3. Body entirely white. This species inhabits Asia and Africa, and is domesticated every where; is three feet eight inches long; sleeps on the highest places, and utters a loud and harsh cry; it is proud and vindictive, and feeds chiefly on grain and insects; it lays five or six eggs in some private place, which are grey-white: the young do not attain all their elegance till the third year. The bill and legs of this beautiful bird are brown; irids yellow; crest gold-green of twenty-four feathers, barbed at the tip, and with white shafts; the line above and beneath the eyes white; head, neck, breast, back and rump green-gold; feathers of the rump, usually called tail-feathers, sometimes five feet long; the real tail-feathers are eighteen in number, grey-brown, about 18 inches long; scapulars and lesser wing-coverts reddish-brown, varied with black, middle ones blue, with a gloss of green-gold, greater and spurious wings rufous; quill-feathers rufous, some of them varied with rufous, blackish and green; belly and vent greenish-black; thighs yellowish. The female has a shorter crest, and has no spur; the feathers of the rump not so long or elegant; the irids are of a lead colour, the bill and fringe on the breast white; the neck is green, the rest of the body and wings brown-ash.

The crest peacock exhibits in India, in its wild state, all the maturity of growth, and glow of colouring. It was an article of importation from that country to Palestine, in the reign of Solomon, in those fleets which conveyed, once in three years, to the court of that monarch invaluable treasures of art and nature. The female of this species is particularly solicitous to conceal her eggs from the male, which not unfrequently destroys them. They both feed chiefly on insects and grain, and prefer elevated situations for roosting, choosing the tops of houses and the highest trees for this purpose. Among the Romans they were regarded as great luxuries, and the young ones are now esteemed as a delicacy. Their voice is extremely harsh and dissonant, and in perfect contrast to that beauty exhibited in their plumage, which seems to combine all that delights the eye in the soft and delicate tints of the finest flowers, all that dazzles in the sparkling lustre of the gem, and all that astonishes in the grand display of the rainbow. See Plate III. Gallinæ of ORNITHOLOGY.

BICALCARATUS; Iris Peacock. Brown; head sub-crested; spurs two. This is found in China, and is larger than a pheasant. The bill is blackish, the upper mandible from the nostrils to the tip red; irids yellow; crown black; face naked; temples white; neck shining brown, with black lines; upper part of the back, shoulders, and wing-coverts brown, with yellowish stripes, the feathers near the tip with a large purple-gold spot; lower part of the back and rump spotted with white; body beneath brown, with transverse black streaks; quill-feathers dusky; legs brown. Individuals of this species have occasionally been brought to England, but they have not found the climate congenial to their habits.

TIBETANUS; Thibet Peacock, is about the size of a pinnado, or more than two feet in length. The specific character is cinereous streaked with blackish; head sub-crested,

and two spurs. The head, neck, and under parts, are ash-coloured, marked with blackish lines; the wing-coverts, back and rump are grey, with small white dots; besides which, on the wing-coverts and back, are large round spots of a fine blue, changing in different lights to violet and green-gold. This bird, as its specific name denotes, inhabits the kingdom of Thibet. The Chinese give it the name of Chinchien-khi.

MUTICUS; Japan Peacock. Head with a subulate crest, and it has no spurs. It is found in the Japan islands, and is of the size of the *P. cristatus*. The bill of this species is large; legs cinereous; area of the eyes red; irids yellow; body blue, mixed with green; head and neck greenish, with blue spots, and a white streak down the middle; belly, wing-coverts, secondary quill-feathers, and thighs cinereous, with black spots, the belly with white streaks; primary quill-feathers green, with transverse black lines, and yellowish towards the tip, which is black; feathers of the rump bay, with white shafts. The belly of the female is black.

PAVOASSAN, in *Geography*, a town of Africa, and capital of the island of St. Thomas, with a good harbour; the residence of the governor, and of the bishop.

PAVOISES. See **PAVAIS**.

PAVONIA, in *Botany*, received that appellation from Cavanilles, in honour of his countryman Joseph Pavon, who shared the labour of various botanical excursions, through Chili and Peru, with Dombey and Ruiz, and who is named, in conjunction with the latter, as author of the splendid *Flora Peruviana*. Mutis had destined for the same purpose the beautiful flower, figured long ago in various old books, under the denomination of *Flos Tigris*, which has but recently become known in the gardens of Europe. This however Linnæus referred to *Ferraria*; and his son, in publishing it, seems to have thought the specific name alluded to the peacock-like spots of the corolla; for he prints it as an adjective, *pavonia*. Many persons have so understood it. This plant is since restored to the rank of a genus; see **TIGRIDIA**.—Cavan. Diff. 132. Schreb. 469. Willd. Sp. Pl. v. 3. 833. Swartz Ind. Occ. v. 2. 1215. Juss. 272. Lamarck Illustr. t. 585.—Class and order. *Monadelphica Polyandria*. Nat. Ord. *Columnifera*, Linn. *Malvacea*, Juss.

Gen. Ch. *Cal.* Perianth inferior, permanent, double; the outer of many linear-lanceolate leaves, rarely combined at the base; inner of one leaf, cup-shaped, divided half way down, rarely more, into five segments. *Cor.* Petals five, roundish, tapering at the base, a little oblique, spreading, united below to the tube of the filaments. *Stam.* Filaments numerous, combined in the form of a tube, about whose apex and surface they become separate; anthers kidney-shaped. *Pist.* Germen globose, furrowed; style thread-shaped, longer than the stamens, in ten segments at the top; stigmas globose. *Peric.* Capsules five, angular at the inner side, convex at the outer, of one cell and two valves, bursting in the upper part. *Seeds* solitary, ovate-oblong, acute.

Ess. Ch. Calyx double; the outer of many leaves or segments. Stigmas ten. Capsules five, of two valves. Seeds solitary.

This genus, separated by Cavanilles from *Hibiscus*, see that article, is rather artificial, there being no difference whatever in habit, and the technical marks of distinction not of the most decisive kind. These are the ten stigmas, which, in *Hibiscus*, are only five, and the finally distinct bivalve capsules, with solitary seeds. In *Hibiscus* the seeds are commonly numerous, in each cell of a five-valved five-celled capsule. This last-named genus being over-burthened with species, it is commodious to lessen their number by any allowable means, and as we presume the Hortus Kewensis,

which so generally follows Willdenow, will adopt *Pavonia*, we do not scruple to admit it. This author reckons up fifteen species.

1. *P. præmorfa* (*P. cuneifolia*; Cav. Diff. 139. t. 45. f. 1. *Hibiscus præmorfus*; Linn. Suppl. 309. Jacq. Ic. Rar. t. 141.)—Leaves roundish-wedge-shaped, abrupt, toothed, downy. Native of the Cape of Good Hope, cultivated in green-houses. The peculiar shape of the leaves at once distinguishes this species. The stem is shrubby, as in every other, except the 7th and 15th. Flowers lemon-coloured, one inch and a half wide; the segments of their outer calyx numerous and setaceous.

2. *P. leptocarpa*. Cav. Diff. 351. (*P. Typhalæa*; Cav. Diff. t. 197. *Urena leptocarpa*; Linn. Suppl. 308.)—Leaves lanceolate, ferrated. Outer calyx of five ovate leaves. Flowers capitate.—Native of Surinam. It is the *Hibiscus salicifolius* of the Pl. Surinam. in *Amœn. Acad.* v. 8. 260, and is known by the Linnæan herbarium only. The leaves are from three to five inches long, pointed, closely ferrated. Flowers yellow, in terminal heads. The inner calyx, smaller than the outer, is rather deeply divided, but not to the base, and the latter has but five leaves, which is a smaller number than the character requires. The capsules are those of a true *Pavonia*, but each is tipped with three points, half its own length, barbed with numerous recurved prickles. This species is very nearly related to the next, for which Cavanilles has figured it, not very correctly as to the calyx, whose divisions he makes not sufficiently deep, at least in the outer one, whereas Linnæus, on the other hand, errs in saying the inner calyx is of five leaves.

3. *P. Typhalæa*. Cav. Diff. 134. (*Urena Typhalæa*; Linn. Mant. 258.)—Leaves oblong-lanceolate, ferrated. Outer calyx of about seven linear leaves. Stem panicled. Flowers somewhat umbellate.—Native of the West Indies. This species, of which a specimen is preserved in the herbarium of the younger Linnæus, has not been well distinguished from the last, which has been generally mistaken for it. The present differs essentially in its panicled many-flowered stem, but especially in having the outer calyx of six or seven narrow linear leaves, or deep segments; whereas the former has five ovate ones. The barbed points are moreover as long as the capsules themselves, and the corolla is said to be white. The calyx of the true *Typhalæa* answers exactly to the generic character, but the preceding species is so closely allied to this, that they cannot be generically disjoined, though the latter has but five segments in its outer calyx.

4. *P. hastata*. Cav. Diff. 138. t. 47. f. 2.—Leaves oblong, hastate, bluntly toothed; densely downy beneath. Stalks axillary, single-flowered.—Gathered by Commerfon at Monte Video. Branches round, subdivided. Leaves dependent, about an inch long; besprinkled with starry hairs above; densely clothed with similar white pubescence beneath, as is the inner calyx especially. The outer calyx is of six, rarely only five, ovate leaves, shorter than the inner. Capsules reticulated, downy, without points or appendages.

5. *P. spinifex*. Cav. Diff. 133. t. 45. f. 2; and *aristata*, t. 45. f. 3. (*Hibiscus spinifex*; Linn. Sp. Pl. 978. Jacq. Hort. Vind. v. 2. 46. t. 103.)—Leaves broad-ovate, doubly crenate. Stalks axillary, single-flowered. Capsules with spreading smooth spines.—Native of South America. The leaves are two or three inches long, and half as broad, roughish to the touch. Flowers large, yellow. Capsules each tipped with three or four spreading, smooth, not barbed, awns or spines.

6. *P. papilionacea*. Cav. Diff. 140. t. 49. f. 2.—Leaves heart-shaped, ferrated. Stalks axillary, single-flowered.

Stamens

Stamens and style declining.—Gathered in Otaheite by Sir Joseph Banks, who communicated it to Cavanilles. *Flowers* large, yellow. Segments of the outer *calyx* very narrow, and longer than in the last.

7. *P. cancellata*. Cav. Diff. 135. (*Hibiscus cancellatus*; Linn. Suppl. 311. Am. Acad. v. 8. 260.)—Leaves heart-shaped, serrated. Outer calyx of twenty bristle-shaped, very hairy leaves. Stem decumbent.—Native of Surinam. The *stem* is herbaceous and trailing, clothed, like the rest of the plant, with prominent bristles. *Leaves* nettle-like. *Stalks* axillary, single-flowered. *Calyx* very remarkable for its numerous narrow segments, whose bristly hairs form a sort of net-work.

8. *P. racemosa*. Swartz Ind. Occ. v. 2. 1215. (*P. spicata*; Cav. Diff. 135. t. 46. f. 1. Malache scabra; Trew. Ehret. 50. t. 90.)—Leaves ovate, pointed, nearly entire. Flowers in a terminal cluster. Outer calyx of eight lanceolate leaves.—Native of bogs, among other shrubs and trees, in Jamaica. The nearly entire, naked *leaves*, roughish to the touch only, and the long terminal solitary *clusters*, of pale yellow, not very large, *flowers*, readily distinguish this species. The *leaves* in our specimens are very nearly entire; Ehret represents them serrated pretty copiously.

9. *P. corymbosa*. Willd. n. 9. (*Althæa corymbosa*; Swartz Ind. Occ. v. 2. 1213.)—Leaves heart-shaped, sometimes angular, smoothish. Flowers corymbose. Stalks and calyx hairy.—Found about the banks of rivers in Hispaniola and Jamaica. The habit is compared by Swartz to *Althæa hirsuta* of Linnæus. *Leaves* not quite smooth, serrated, sometimes almost sinuated as well as angular. *Flowers* yellow, rather large. Outer *calyx* of ten or twelve linear hairy leaves. *Capsules* rough. We have seen neither specimen nor figure.

10. *P. paniculata*. Cav. Diff. 135. t. 46. f. 2.—Leaves roundish-heart-shaped, serrated, with one or three points. Clusters compound, hairy. Stamens and style declining.—Native of Peru, near the source of the river Maragnon. *Dombey*. It seems, as Willdenow remarks, nearly akin to the last. The *flowers* are yellow, very numerous. *Stamens* drooping. *Style* ascending at the extremity.

11. *P. odorata*. Willd. n. 11.—Leaves ovate, somewhat heart-shaped, with three points, slightly toothed. Stalks axillary, single-flowered. Outer calyx of about twelve leaves.—Native of the East Indies.—The whole *plant* is hairy and viscid. *Leaves* oblong, slightly heart-shaped at the base. *Flower-stalks* long, sometimes assembled into a sort of *cluster* at the top of the *stem*. *Calyx* fringed. *Corolla* rather small, apparently red. *Willd.*

12. *P. coccinea*. Cav. Diff. 140. t. 47. f. 1. (*Malva folio hederaceo, flore coccineo*; Plum. Ic. 162. t. 169. f. 2.)—Leaves heart-shaped, three-lobed, serrated. Stalks axillary, single-flowered, ascending. Outer calyx of five linear-lanceolate leaves.—Native of Hispaniola, not of Dominica. Linnæus misquotes the figure of Plumier, for *Hibiscus* (or rather *Achæmia Malvaviscus*). The *flowers* appear to be large, standing erect in an elegant manner, the lower part of the *petals* cohering in the form of a tube, the extremities drooping. Plumier represents more than five leaves to the outer *calyx*, but Cavanilles examined a specimen.

13. *P. Columelka*. Cav. Diff. 138. t. 48. f. 3.—Leaves with five angles, serrated, nearly smooth; the uppermost oblong and undivided. Stalks axillary, single-flowered, shorter than the footstalks. Outer calyx of five linear-lanceolate leaves.—Found by Commerçon in the isle of Bourbon, growing abundantly by the sides of the roads cut through the woods. The *leaves* are shaped somewhat like

those of a vine. *Flowers* small, purplish, not unlike a common Mallow.

14. *P. urens*. Cav. Diff. 137. t. 49. f. 1. Jacq. Ic. Rar. t. 552.—Leaves with seven angles, hairy, cut and serrated. Flowers axillary, clustered, nearly sessile.—Native of the island of Mauritius. The *flowers* are of an elegant rose-colour, deeper in the centre, much resembling a common Mallow. *Capsules* with three barbed points, or beaks. *Leaves* and *stems* rough with pungent hairs.

15. *P. zeylanica*. Cav. Diff. 134. t. 48. f. 2. (*Hibiscus zeylanica*; Linn. Sp. Pl. 981. Burm. Ind. t. 48. f. 3.)—Leaves roundish-heart-shaped, cut, lobed, or deeply divided, bluntly toothed. Stalks axillary, single-flowered, equal to the footstalks. Outer calyx of ten linear bristly leaves.—Native of Ceylon. *Root* annual. *Stem* herbaceous, downy, somewhat branched. The *leaves* vary greatly as to their divisions, being sometimes divided to the very base into five oblong blunt segments. *Flowers* small, red. This species is now and then seen in gardens, but valued rather for the sake of rarity than beauty. Scopoli has figured the deeply divided variety, under the name of *Hibiscus arenarius*, Delic. Infubr. fasc. 3. t. 2, which we do not find quoted.

16. *P. spiralis*. Cav. Ic. v. 5. 20. t. 434.—Leaves heart-shaped, serrated, pointed, somewhat lobed. Stalks axillary, single-flowered. Outer calyx of many linear fringed leaves. Petals convoluted, each with a lateral tooth.—Gathered by Louis Née, in the island of Tobago, five leagues from Panama, flowering and fruiting in November. The *stem* is shrubby, six feet high. *Leaves* most like those of the tenth species, but it is not said whether they are smooth or otherwise. Outer *calyx* of nine linear hairy leaves. *Petals* scarlet, rolled together like those of *Achæmia Malvaviscus*, but larger, the *stamens* and *style* projecting far beyond them. This species is unnoticed by Willdenow, and might perhaps be introduced between the tenth and eleventh. S.

PAVONIA, or *Pavonina*, in *Ornithology*, a species of *Ardea*. See HERON.

PAVONIUS LAPIS, the *peacock-stone*, a name given by Ludovicus Dulcis, and other writers of his time, to a stone of which they say many idle things, such as its having the virtue of gaining a person's love to another, and the like. They have left us no description of it, but probably it was one of the variegated agates.

PAVOOR, in *Geography*, a town of Hindoostan; 15 miles N.W. of Tinevelly.

PAUPAKELLY, a town of Hindoostan, in Golconda; 20 miles S. of Byarem.

PAUPANASSUM, a town of Hindoostan; 20 miles W.S.W. of Tinevelly.

PAUPANASSY, a town of Hindoostan, in the Carnatic; 12 miles N.E. of Tanjore.

PAUPER, in *Law*. See *FORMA Pauperis*, and POOR.

PAURÆDRASTYLÆ, in *Natural History*, the name of a genus of crystals. The word is derived from the Greek *παυρος*, a few, *εδρα*, a side, or plane, the privative particle *α*, not, and *συλος*, a column, and expresses a fossil composed of but a few sides or planes, and having no column.

The bodies of this genus are crystals, composed of two pyramids joined base to base, without the intervention of a column; these being both hexangular, and consequently the whole body composed only of twelve planes; the others of the same structure being composed of sixteen. Of this genus there are only four known species.

PAUREY, in *Geography*, a town of Africa, on the Slave coast. N. lat. 6° 10'. E. long. 0° 15'.

PAURWITZ. See BAUERWITZ.

PAUSA, a town of Saxony, in the Vogtland; 72 miles W.S.W. of Dresden. N. lat. $50^{\circ} 31'$. E. long. $11^{\circ} 58'$.

PAUSANIA, Παιωνία, in *Antiquity*, a festival in which were solemn games, wherein freeborn Spartans only contended. It had its name from Pausanias, the Spartan general, under whose conduct the Grecians overcame Mardonius, in the famous battle at Platæa, there being always an oration in praise of him.

PAUSANIAS, in *Biography*, a celebrated Lacedæmonian commander, who fell at the famous straits of Thermopylæ, was the son of Cleombrotus, and nephew of Leonidas. He obtained a high rank in the magistracy of his country, and when Mardonius, the Persian general, invaded Greece with a mighty host, Pausanias was appointed commander-in-chief of the allied army raised to oppose him. He brought on a general engagement at Platæa, in the year 479 B.C., in which Mardonius was killed, and his army defeated with great slaughter. With the assistance of the Athenians, the camp of Mardonius was taken with an immense booty. Pausanias exhibited a greatness of mind in rejecting the proposal of one of the leaders, that the body of the Persian general should be fought for, in order that it might be treated with the same indignity that had been offered to that of Leonidas. He proceeded to punish the traitors to the cause of Greece, and marching to Thebes, obliged that city to deliver up the heads of the Persian party, whom he put to death. The effect of success upon his own mind was to nourish a spirit of pride and arrogance, and inspire ambitious designs. He assumed to himself all the honour of the victory of Platæa, and upon a golden tripod, which he presented to the temple of Delphi, he put an inscription that was honourable to himself alone. In the command of the united fleet, which had been given him for the purpose of freeing the Grecian cities from Persian garrisons, he behaved with great partiality to his own countrymen, and created many enemies; while the justice of Aristides, and the affability of Cimon, gained all hearts, and restored to the Athenians the naval supremacy of Greece. Suspensions were entertained that he meant to assume the full controul of Greece, and to get the power of the country in his own hands, and on this account he was recalled to Sparta, and underwent a trial for his life, but as the evidence was inconclusive, he was fined and liberated. When he returned to the army, he openly adopted the Persian habit and manners, and went into all the excesses of that luxury which he had formerly decried. It was supposed that his mind was deranged, owing to the following tragical incident. Having been captivated by the charms of Cleonice, a young woman of good family at Byzantium, her parents not daring to refuse his solicitations, obliged her to comply with his desires. To save her blushes, it was agreed that the lights should be extinguished when she entered his chamber. In the dark she unfortunately stumbled over one of the lamps; the noise of which suddenly awakening Pausanias, he fancied an assassin was coming to murder him, and, starting up, plunged a dagger into her breast. When he discovered the fatal error, he was almost distracted, and from that moment imagined that the blood of Cleonice was perpetually crying out for vengeance. He left Byzantium, and repaired to Heraclea, where he found persons who pretended to evoke and pacify the spirits of the deceased. That of Cleonice was called up before him, and made to say to him, "When you come to Sparta, you will find a termination to your sufferings." He went thither, still occupied with the thought of betraying his country to the Persians. For this purpose, he carried on a correspondence with Artabazus, a satrap; and all the messengers he sent were put to death, that

they might not betray him on their return. It is said that he in vain attempted to engage Themistocles, who was at that time an exile, to concur in his measures, and being impatient, he wrote a peremptory letter to Artabazus, which he committed to one Argilius, his particular favourite. The young man, alarmed by the reflection, that none of the former messengers returned, unsealed the packet entrusted to his care, and finding a direction to put him to death, immediately disclosed the matter to the ephori. They resolved to apprehend him, but being apprized of their intention, he fled into the temple of Minerva, from whence he could not be taken. While they were hesitating as to what could be done, the mother of Pausanias brought a brick, and set it against the door of the temple: her example was followed, till he was completely immured. When he was dead with hunger, his body was brought out, and interred by his friends. Corn. Nep. Univer. Hist.

PAUSANIAS, a Greek topographical writer, who flourished in the second century, under Adrian, and the Antonines, was probably a native of Cæsarea, in Cappadocia, and studied under the celebrated Herodes Atticus. Though as a speaker defective in his pronunciation, he obtained a high reputation by his compositions. He declaimed both at Athens and Rome, in which last named city he died at an advanced age. He seems to have been a great traveller, and besides his work on Greece that is extant, he composed descriptions of Syria and Phœnicia. The "Description of Greece" is highly valuable to the antiquary, and contains much information no where else to be met with. It is a kind of itinerary through Greece, in ten books, in which the author notes every thing remarkable that fell under his observation, such as temples, theatres, sepulchres, statues, paintings, public monuments of all kinds, the scites and dimensions of ruined cities, and the scenes of important transactions. In some parts he gives historical details, and in those his style, which is frequently negligent, rises to a degree of dignity. His work abounds with fabulous narrations, but what he himself saw, there is no reason to suppose he misrepresented. His work was first published in 1516, at the press of Aldus. The best edition has been reckoned that of Kuhnus, Greek and Latin, 1696, but others give the preference to the modern one of I. F. Facius, Lips. 1794-7, in four volumes, 8vo. There is a French translation in high estimation, by the abbé Gedoyn. Mœri.

PAUSARY, PAUSARIUS, in ancient Rome, an officer who, in the solemn pomps or processions of the goddess Isis, directed the stops, or pauses.

In these ceremonies, there were frequent stands at places, prepared for the purpose, wherein the statues of Isis and Anubis were set down; much after the manner of resting-places in the procession of the holy sacrament in the Romish church.

These rests were called *mansiones*: the regulation of which was the office of these *pausarii*.

From an inscription quoted by Salmasius it appears, that the Romans had a kind of college or corporation of *pausarii*.

PAUSARY, *Pausarius*, was also a name given to an officer in the Roman galleys, who gave the signal to the rowers, and marked the times and pauses; to the end they might act in concert, and row all together.

This was always done with a musical instrument. Hyginus says, that, in the ship Argo, Orpheus did the office with his lyre.

PAUSE,

PAUSE.

PAUSE, a stop or cessation of speaking, singing, playing, or the like.

The word is formed from the Latin *pausa*, which we find used in Lucretius and Plautus in the same sense.

The use of pointing in grammar is, to make the proper pauses in certain places. See POINT and PUNCTUATION.

The use of these pauses is equally necessary to the speaker and to the hearer: to the speaker, that he may take breath, without which he cannot proceed far in his delivery, and that he may relieve the organs of speech by these temporary rests, which otherwise would be soon tired by continued and uninterrupted action; to the hearer, that the ear also may be relieved from the fatigue which it would otherwise endure from a continuity of sound, and that the understanding may have sufficient time to mark the distinction of sentences, and their several members.

Pauses in common discourse, and in most compositions in prose, have, besides the duration, marks of a surer kind annexed to them to point out their nature: and these are certain notes of the voice, which declare of what kind the pauses are, at the instant they are made; and inform the mind what it is to expect from them; whether the sense is still to be continued in the same sentence; whether the preceding one is to be the last member of the sentence; or whether the sentence is closed, and a new one is to begin. By means of these notes or tones, the speaker may proportion his pauses to the importance of the sense, and not merely to the grammatical structure of words in sentences. A proposition, or sentiment of peculiar moment, may be preceded or closed by a longer pause than usual: a pause may be also made before some very emphatical word, but this is a liberty that should be used with great caution. An ingenious writer on this subject observes, that pauses in general depend upon emphasis: words are sufficiently distinguished from each other by accent; but to point out their meaning, when ranged in sentences, emphases and pauses are necessary. Accent, says this writer, is the link which connects syllables together, and forms them into words: emphasis is the link which connects words together, and forms them into members of sentences; but that there may be no mistake to which emphasis the words belong, at the end of every such member of a sentence there ought to be a perceptible pause. Sheridan's Lectures, p. 75, &c. See COMMA, COLON, POINTS, &c.

Pauses are commonly distinguished into those that are emphatical, and those that mark the distinctions of sense. An emphatical pause is made, after something has been said of peculiar moment, and on which we want to fix the hearer's attention. Sometimes such a thing is introduced with a pause of this nature. Such pauses have the effect of a strong emphasis, and are subject to the same rules, especially to the caution of not repeating them too frequently: for as they excite uncommon attention, and of course raise expectation, they will occasion disappointment and disgust, if the importance of the matter be not fully answerable to such expectation. But the most frequent and the principal use of pause is to mark the divisions of the sense, and, as we have already said, to allow the speaker to draw his breath. The proper and graceful adjustment of such pauses is one of the most nice and difficult articles in delivery. The speaker, in order to avoid mangling his sentences, and totally losing the force of the emphasis, should be careful to provide a full supply of breath for what he is to utter. It is a great mistake, says Dr. Blair, to imagine that the breath must be drawn only at the end of a period, when the voice is allowed a fall. It may easily be gathered at the intervals of the period, when the voice is only suspended for a moment;

and, by this management, we may have always a sufficient stock for carrying on the longest sentences, without improper interruptions. If any one, as the same ingenious author observes, shall have formed to himself a certain melody or tune, which requires rests and pauses of its own, distinct from those of the sense, he has undoubtedly contracted one of the worst habits into which a public speaker can fall. It is the sense which should always rule the pauses of the voice; for whenever there is any sensible suspension of the voice, the hearer is always led to expect somewhat corresponding in the meaning. Pauses, in public discourse, must be formed on the manner in which we utter ourselves in ordinary, sensible conversation; and not upon the stiff artificial manner, which we acquire from reading books according to the common punctuation, which is often arbitrary, capricious, and false, and dictates an uniformity of tone in the pauses, that is extremely disagreeable. In order to render pauses graceful and expressive, they must not only be made in the right place, but also be accompanied with a proper tone of voice, by which the nature of these pauses is intimated, much more than by the length of them, which can never be exactly measured. Sometimes it is only a slight and simple suspension of voice that is proper; sometimes a degree of cadence in the voice is required; and sometimes that peculiar tone and cadence, which denote the sentence finished. In all these cases, we are to regulate ourselves, by attending to the manner in which Nature teaches us to speak, when engaged in real and earnest discourse with others.

In reading or reciting verse, there is a peculiar difficulty in making the pauses justly. The difficulty arises from the melody of verse, which dictates to the ear pauses or rests of its own; and to adjust and compound these properly with the pauses of the sense, so as neither to hurt the ear nor offend the understanding, is so very nice a matter, that it is no wonder we seldom meet with good readers of poetry. There are two kinds of pauses that belong to the music of verse: one is the pause at the end of the line; and the other, the caesural pause in the middle of it. With regard to the pause at the end of the line, which marks the strain or verse to be finished, rhyme renders this always sensible, and in some measure compels us to observe it in our pronunciation. In blank verse, where a greater liberty is allowed of running the lines into one another, sometimes without any suspension in the sense, it has been questioned, whether, in reading such verse with propriety, any regard at all should be had to the close of the line. On the stage, where the appearance of speaking in verse should always be avoided, there can be no doubt, in the opinion of Dr. Blair, that the close of such lines as make no pause in the sense should not be rendered perceptible to the ear. But on other occasions, this would be improper: for what is the use of melody, or for what end has the poet composed in verse, if, in reading his lines, we suppress his numbers; and degrade them, by our pronunciation, into mere prose? We ought, therefore, certainly to read blank verse so as to make every line sensible to the ear. At the same time, in doing so, every appearance of sing-song and tone must be carefully avoided. The close of the line, where it makes no pause in the meaning, ought to be marked not by such a tone as is used in finishing a sentence; but without either letting the voice fall, or elevating it, it should be marked only by such a slight suspension of sound, as may distinguish the passage from one line to another, without injuring the meaning.

The other kind of musical pause is that which falls somewhere about the middle of the verse, and divides it into two hemistichs; a pause not so great as that which belongs to
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the close of the line, but still sensible to an ordinary ear. This, which is called the *cæsural pause*, falls uniformly, in the French laconic verse, on the middle of the line. In the English, it may fall after the fourth, fifth, sixth, or seventh syllables in the line, and no other. Where the verse is so constructed, that this *cæsural pause* coincides with the slightest pause or division in the sense, the line can be read easily; as in the two first verses of Mr. Pope's *Messiah*:

“Ye nymphs of Solyma! begin the song;
To heavenly themes, sublimer strains belong.”

But if it shall happen that words, which have such a strict and intimate connection, as not to bear even a momentary separation, are divided from one another by this *cæsural pause*, we then feel a sort of struggle between the sense and the sound, which renders it difficult to read such lines gracefully. The rule of proper pronunciation, in such cases, is to regard only the pause which the sense forms, and to read the line accordingly. The neglect of the *cæsural pause* may make the line sound somewhat unharmoniously; but the effect would be much worse, if the sense was sacrificed to the sound. For instance, in the following line of Milton:

“——— What in me is dark,
Illumine; what is low, raise and support.”

The sense clearly dictates the pause after “illumine,” at the end of the third syllable, which, in reading, ought to be made accordingly; though, if the melody only were to be regarded, “illumine” should be connected with what follows, and the pause not made till the fourth or sixth syllable. So, in the following line of Mr. Pope's (*Epistle to Arbuthnot*):

“I sit, with sad civility I read.”

The ear plainly points out the *cæsural pause* as falling after “sad,” the fourth syllable. But it would be very bad reading to make any pause there, so as to separate “sad” and “civility.” The sense admits of no other pause than after the second syllable “sit,” which, therefore, must be the only pause made in the reading.

It is a distinguishing advantage of our English verse, that it allows the pause to be varied through four different syllables in the line; for as the pause is placed after one or other of these syllables, the melody of the verse is much changed, its air and cadence are diversified. By these means, uncommon richness and variety are added to English versification. When the pause falls earliest, that is, after the fourth syllable, the briskest melody is thereby formed, and the most spirited air given to the line. In the following lines of the *Rape of the Lock*, Mr. Pope has, with exquisite propriety, suited the construction of the verse to the subject:

“On her white breast | a sparkling cross she wore,
Which Jews might kiss | and infidels adore;
Her lively locks | a sprightly mind disclose,
Quick as her eyes | and as unfix'd as those.
Favours to none | to all she smiles extends,
Oft she rejects | but never once offends.”

Where the pause falls after the fifth syllable, which divides the line into two equal portions, the melody is sensibly altered. The verse loses that brisk and sprightly air, which it had with the former pause, and becomes more smooth, gentle, and flowing.

“Eternal sunshine | of the spotless mind,
Each prayer accepted | and each wish resign'd.”

When the pause proceeds to follow the sixth syllable, the tenor of the music becomes solemn and grave. The verse marches now with a more slow and measured pace, than in either of the two former cases.

“The wrath of Peleus' son | the direful spring
Of all the Grecian woes | O goddesses sing!”

But the grave, solemn cadence becomes still more sensible, when the pause falls after the seventh syllable, which is the nearest place to the end of the line that it can occupy. This kind of verse occurs the seldomest, but has a happy effect in diversifying the melody. It produces that slow Alexandrian line, which is finely suited to a close; and for this reason, such lines almost never occur together, but are used in finishing the couplet.

“And in the smooth description | murmur still.
Long loved adored ideas! | all adieu.”

Blank verse, being of a freer kind than rhyme, and naturally read with less cadence or tone, its pauses, and the effect of them, are not always so sensible to the ear. It is, however, constructed upon the same principles, with respect to the place of the pause. Some, indeed, have maintained that heroic verse admits of musical pauses, not only after the four syllables to which their place is above assigned, but after any one syllable in the verse indifferently, where the sense directs it to be placed. But this, says Dr. Blair, is the same thing as to maintain that no pause at all belongs to the natural melody of the verse; since, according to this notion, the pause is formed entirely by the meaning, not by the music. But this, he apprehends, is contrary both to the nature of versification, and to the experience of every good ear. Blair's *Lectures*, vols. ii. and iii. See *PROSODY* and *VERSIFICATION*.

Pauses, or silences, are the same in poetry as the odd-rests in music, which serves to make the odd notes even ten. St. Austin instructs us how the pauses are to be made according to the laws of music.

PAUSE, in *Music*, is a cessation of sound, marked with a character commonly called in England a bull's eye, ◡; but by the Italians a *corona*, or crown. The pause used to be of an unlimited duration in the middle of a piece, different from common rests, all which represent the duration of some note in the time-table. Emanuel Bach was the first who measured pauses by a rest of one, two, or three bars; which method has been adopted by Haydn, Mozart, and others, a method which is very convenient in symphonies and full pieces; as, when it was left to the will or sagacity of the several performers, they never, after a pause, resumed the strain together. See *RESTS*, and *CORONA*.

For the signs and characters of pauses, see *CHARACTERS*.

PAUSEBASTOS, in *Natural History*, the name of a beautiful stone dedicated to Venus, and called also *paneros*. It seems to have been a beautiful agate.

PAUSICAPE, Παισικαπη, among the Athenians, a kind of punishment. A round engine was put about the neck in such a manner, that the sufferer could not lift his hand to his head.

PAUSILIPO, or *POSILIPO*, in *Geography*, a celebrated mountain and grotto, near the city of Naples. It took its name from a villa of Vedius Pollio, erected in the time of Augustus, and called “*Pausilypan*,” from the effect which its beauty was supposed to produce in suspending sorrow and anxiety. This mountain is said to be beautiful in the extreme, and to be justly honoured with its appellation, as no scene is better calculated to banish melancholy and exhilarate the mind. The grotto is nearly a mile in length, and

is made through the mountain. 20 feet in breadth and 30 in height. On the mountain Vedius Pollio had not only a villa, but a reservoir or pond, in which he kept a number of lampreys, to which he used to throw such of his slaves as had committed a fault. When he died, he bequeathed among other parts of his possession his villa to Augustus; but this monarch, abhorring a house where so many ill-fated creatures had lost their lives for very slight faults, caused it to be demolished, and the finest materials in it to be brought to Rome, and with them raised Julia's portico.

Virgil's tomb is said to be above the entrance of the grotto of Paullipo. A vaulted cell and two modern windows above present themselves to view: the poet's name is the only ornament of the place. No sarcophagus, no urn, and even no inscription, serve to feed the devotion of the classical pilgrim. The epitaph, though not genuine, is yet ancient; it was inscribed by order of the duke of Pescobrangiano, the proprietor of the place, on a marble slab placed in the side of the rock opposite to the entrance of the tomb, where it still remains. It is as follows:

“Mantua me genuit. Calabri rapuere, tenet nunc
Parthenope, cecini pascua, rura, duces.”

An Italian author, supposed to be Pietro de Steffano, assures us that he himself had seen, about the year 1526, the urn supposed to contain the poet's ashes, standing in the middle of the sepulchre, supported by nine little marble pillars, with the inscription just quoted on the frieze. He adds, that Robert of Anjou, apprehensive lest such a precious relic should be carried off or destroyed during the wars then raging in the kingdom, took the urn and pillars from the tomb, and deposited them in the Castel Nuovo. This extreme precaution eventually occasioned the loss which it was meant to prevent: for notwithstanding the most laborious search and frequent inquiries made by the orders of Alphonso of Arragon, they were never more discovered. Some, indeed, have asserted, that the tomb just mentioned is not the sepulchre of Virgil. Among these we may reckon Cluverius and Addison. The reader will learn with regret that Virgil's tomb, consecrated as it ought to have been to genius and meditation, is sometimes converted into the retreat of assassins, or the lurking-place of Sbirri. Few places, however, are in themselves more picturesque, and from the recollection inseparably interwoven with it, no spot is more interesting than the tomb of Virgil. The whole hill of Paullipo is covered with country seats and gardens, for summer resort, being protected from the hot south and west. In the middle of the passage is a church or chapel; but the dust raised by the horses and carriages is very offensive.

PAUSIS, a word used by the old physicians for a remission in acute diseases.

PAUSUS, in *Entomology*, a genus of insects of the order Coleoptera. The generic character is as follows; antennæ two-jointed, the upper joint very large, inflexed, hooked, pedicellate; head pointing forwards, with a convex jugular triangle; thorax narrow, unequal, scutellate; shells flexile, deflected, truncate; fore-feet placed at the fore-part of the breast, thighs with minute appendages, the tarsi four-jointed. Five species are enumerated in Gmelin's edition of Linnæus, of which the first and second are fully described in the 4th volume of the Transactions of the Linnæan Society. This genus was not known when the 12th edition of the *Systema Naturæ* first appeared; and it obtained its present rank in 1775, owing to a dissertation published by Linnæus at Upsal. At this period one species only was mentioned. The etymology of the generic term is thought to be from the Greek *παυσις*, signifying a pause, cessation, or rest, because Lin-

næus, now old and infirm, and sinking under the weight of age and infirmity, saw no probability of continuing any longer his career of glory. He might therefore be supposed to say, “*hic meta laborum*,” as it really proved, at least with regard to insects, Pausus being the last he ever described. Such is the account given by Dr. Afzelius in the work already referred to.

Species.

MICROCEPHALUS. The head of the species is unarmed; the club is an oblong; shells as long as the body, not punctured, shanks linear. This rare insect is a native of Sierra Leona, the Banana, and neighbouring islands. The body is of a dark chestnut-brown; the head is, as its name denotes, uncommonly small; the shield is two-parted; jugular triangle minute; pivots of the antennæ black, upper joint of the club much larger than the head; the thorax broader than the head, and the wings are footy.

SPHÆROCERUS. Head horned, club globular; shells shorter than the abdomen, punctured; shanks dilated at the tip. This is found at Sierra Leona; the body is polished, chestnut, a little narrower than the last; the horn between the eyes is straight, conical, tipped with a tuft of cartilaginous hairs; the eyes are larger; the thorax is of the same breadth as the head, the wings are of a shining changeable violet. We shall give part of Dr. Afzelius' description of this insect in his own words: “There was,” says he, “a house building for the governor, on an eminence called Thornton Hill, at the south end of Free-town, in Sierra Leona; and in the beginning of the year 1795, several apartments having been got ready, so as to be habitable, one of them was allotted to me, and I removed into it in the end of the month of January. I had not resided there many days, when one evening, having just lighted my candle and begun to write, I observed something dropping down from the ceiling before me upon the table; which from its singular appearance attracted my attention. It remained for a little while quite immovable, as if stunned or frightened, but began soon to crawl very slowly and steadily. I then caught it, and from the remembrance I had of the Linnæan species, I directly took it for a non-descript of this genus. Some days after, coming into my room from supper, with a light in my hand, and having put it upon the table, there instantly fell another down from the ceiling. The third I was favoured with by the then governor Mr. Dawes, who informed me that it had dropped down before him on the table, just when he had entered his room, and was going to write. The other three, which I afterwards collected, were also got upon similar occasions, and from thence I thought I had some reason to conclude that it was a nocturnal animal; that it becomes benumbed by candle-light; that it lives in wood, and prefers newly-built houses. After the end of February I never saw any more. The last which I caught I put into a box, and left confined there for a day or two. One evening going to look at it, and happening to stand between the light and the box, so that my shadow fell upon the insect, I observed, to my great astonishment, the globes of the antennæ like two lanterns, spreading a dim phosphoric light. This singular phenomenon raised my curiosity, and, after having examined it several times that night, I resolved to repeat my researches the following day. But the animal, being exhausted, died before morning, and the light disappeared.”

RUBER. Reddish; thorax jagged before. This and the next species inhabit the Cape of Good Hope.

LINEATUS. Reddish; shells with a brown line. This is supposed to be the *Cerocoma lineata* of Fabricius.

RUFICOLLIS. Black; thorax and streak on the shells ferruginous,

ferruginous, supposed to be the *Cerocoma ruficollis* of Fabricius.

PAUTE', in *Geography*, a town of South America, in the audience of Quito; 23 miles E. of Cuença.

PAUTÉ, or *St. Tago*, a river of Peru, which runs into the Maranon; five miles W. of St. Francisco de Borja.

PAUTO, a town of New Granada; 25 miles E. of Tunja.

PAUTRE, ANTONY LE, in *Biography*, an eminent French architect, was born at Paris in 1614. He distinguished himself by his taste in the decoration of buildings. Several edifices from his designs were erected in the capital and its neighbourhood, of which the most noted were the wings of St. Cloud; the church of the nunnery of Port-Royal, and the hotels of Gevres and Beauvais. He was appointed architect to the king's brother, and afterwards to the king himself. He was a member of the Academy of Architecture from its first institution, and published a work on that art, entitled "Les Œuvres d'Architecture d'Antoine le Pautre," of which the first edition appeared in 1652. He died in 1691. He had a brother an eminent engraver, who died in 1682; and his son, Peter, who was born in 1660, was eminent as a sculptor. He studied fourteen years at Rome, and on his return was employed in several public works, of which the most celebrated is a group of Eneas bearing Anchises on his shoulders, and holding Ascanius in his hand, which was placed in the garden of the Thuilleries. He died in 1744, at the age of eighty-four.

PAUTUCKE, in *Geography*, a town of America, in the state of Massachusetts; 33 miles S.S.W. of Boston.

PAUW, N. DE, in *Biography*, a German canon, distinguished himself by his philosophical writings, of which the principal were "Recherches Philosophiques sur les Américains, les Egyptiens, et les Chinois," in two vols. 1768; and "Recherches Philosophiques sur les Grecs," two vols. 1787, reprinted at Paris in seven vols. 8vo. "In these works," says his biographer, "there are much learning and ingenuity, but joined with a bold spirit of conjecture, and a disposition to contradict all received notions." They were very popular at the time of their appearance, but have lost a great part of their original reputation. The author was in high estimation with Frederick the Great, as one of the free speculators of the time, and was, of course, obnoxious to the clergy. His private character was excellent. He died at Xanton, near Aix-la-Chapelle, in 1799; a nephew of his was Anacharis Cloots, who was famous at the commencement of the French revolution.

PAUXI, in *Ornithology*, the name of an American bird described by Nieremberg. See CRAN *Pauxi*.

PAUXIS, in *Geography*, a fortress of Brasil, in the government of Para, on the N. side of the river Amazon. S. lat. 1 56'. W. long. 58 10'.

PAUZEN, a town of Bohemia, in the circle of Boleſlau; 10 miles E. of Jung Buntzel.

PAUZK, PAUTZK, or *Putzig*, a town of Prussian Pomerania; 24 miles N.E. of Dantzick. N. lat. 54 30'. E. long. 18 3'.

PAW, in the *Manege*. A horse is said to *paſw* the ground when his leg being either tired or painful, he does not rest it upon the ground, and fears to hurt himself as he walks.

PAW *Patté*, in *Heraldry*, the fore-foot of a beast cut off short. If the whole leg be cut off, it is called *gambé*. Lion's-paws are much used in armoury.

PAWAH, in *Geography*, a town of Hindoostan, in Bahar; 40 miles S.W. of Bahar.

PAWARAH, a town of Hindoostan; 43 miles N.W. of Benares.

PAWEN, a small island in the bay of Gunong Tellu, on the E. coast of the island of Celebes. S. lat. 0° 18'. E. long. 122° 2'.

PAWING, or POGUM, a town of East Friesland, near the Ems; 32 miles S. of Emden.

PAWLE, in a *Ship*. See PAUL.

PAWLET, in *Geography*, a township of America, in Rutland county, Vermont, containing 1938 inhabitants. It is watered by Pawlet river, which joins Wood creek, and the confluent stream falls into South bay at Fiddler's Elbow.

PAWLOCZ, a town of Russian Poland, in the palatinate of Kiev; 60 miles S.W. of Kiev.

PAWN, PIGNUS, a pledge or gage for surety of payment of money lent. It is said to be derived, a *pugno*, quia res quæ pignori dantur, pugno vel manu traduntur. (Lit. Dict.) The party that pawns goods hath a general property in them; they cannot be forfeited by the party that hath them in pawn, for any offence of his, nor be taken in execution for his debt; neither may they otherwise be put in execution till the debt for which they are pawned is satisfied. Litt. Rep. 332.

If the pawn is laid up, and the pawnee robbed, he is not answerable; though if the pawnee use the thing, as a jewel, watch, &c. that will not be the worse for wearing, which he may do, it is at his peril; and if he is robbed, he is answerable to the owner, as the using occasioned the loss, &c. Ibid. See BAILMENT.

If the pawn is of such a nature that the keeping is a charge to the pawnee, as a cow, or a horse, &c. he may milk the one, and ride the other, and this shall go in recompence for his keeping. Ibid.

Things which will grow the worse by using, as apparel, &c. he may not use. If a pawnbroker receives plate or jewels, as a pledge or security, for the repayment of money lent thereon at a day certain, he has them upon an express contract or condition, to restore them, if the pledger performs his part by redeeming them in due time (Cro. Jac. 245. Yelv 178.); for the due execution of which contract many useful regulations are made by statute 30 Geo. II. c. 24. See *Pawn-BROKERS*.

PAWN, among *Miners*, is a pledge of money put into the bar-matter's hand, at the time when the plaintiff causes the bar-master to arrest the mine.

PAWN-BROKERS. See *Pawn-BROKERS*, and 39 & 40 Geo. III. c. 99.

PAWNAGE. See PANNAGE.

PAWNEES, in *Geography*, the name of an Indian nation, inhabiting a part of Louisiana, consisting of three villages. The number of warriors is 1993, of women 2170, and of children 2060, according to the statement made in the "Exploratory Travels in North America."

PAWNGAW, a town of Hindoostan, in Dowlatabad; 20 miles E. of Perinda.

PAWTUCKET FALLS, a cataract of America, in Merrimack river, in the township of Dracut.

PAWFUXET, a village of America, in the township of Craniton, Providence county, Rhode island.

PAX, a small metallic plate, commonly of silver, with the representation of the crucifixion engraved upon it, which was kissed by the priest at a certain part of the mass, he repeating at the same time *Pax tecum*, Peace be to you, and afterwards by the assistants in token of fraternal charity.

PAX *Dei*. See PEACE of God.

PAX *Ecclesiaz*. See SANCTUARY.

PAX *Regis*. See PEACE of the King.

"Longe debet esse pax regis a parte sua, ubi residens fuerit, a quatuor partibus loci illius, hoc est quatuor milliaria & tres quarentenæ, & novem acra latitudine, & novem pedes, & novem palmæ, & novem grana hordei, &c." Leg. Edw. Confess.

Ad PACEM redire, to restore to the peace, is to reverse an outlawry; whereby a person is restored to the benefit of the king's peace.

"Rex potest dare quod suum est, hoc est, pacem suam quam utlagatus amisit." Bracton, lib. iii.

PAXAROS, or *Bird-Island*, in *Geography*, a small island near the S. coast of Cuba. N. lat. $19^{\circ} 56'$. W. long. $78^{\circ} 24'$.—Also, an island on the coast of California, in the North Pacific ocean. N. lat. $30^{\circ} 18'$. W. long. $120^{\circ} 45'$.—Also, small islands or rocks in the Pacific ocean, near the coast of Chili. S. lat. $29^{\circ} 40'$.

PAXIMADES, an island in the Mediterranean, near the S. coast of the island of Candia. N. lat. $34^{\circ} 54'$. E. long. $24^{\circ} 43'$.

PAXTON, *Upper, Lower, and Middle*, three townships in Dauphin county, Pennsylvania: the first contains 2274, the second 727, and the third, including Swatara, 3208 inhabitants.—Also, a township of Worcester county, Massachusetts; 8 miles W. of Worcester, incorporated in 1765, and containing 582 inhabitants.

PAY of the *Army and Navy*, is the stipend or salary allowed for each individual serving in the army or navy; for which we refer the reader to the Registers published annually, and in almost every body's hands.

In our ancient armies, there were, at all times, both before and after the conquest, besides the feudal tenants, stipendiary or mercenary soldiers, natives as well as foreigners. But our earliest information respecting military pay reaches no higher than the reign of king Henry II. Mr. Grose, in his "Military Antiquities," vol. i. has given an account of the amount of the pay of officers and soldiers at different periods; and from his account it appears, that the pay of the troops, as it was established at the Revolution, underwent very little change till after the commencement of the present war in 1793. But in the course of the present war, the pay and allowance of the officers and soldiers have received considerable augmentation. In 1795 his majesty issued a warrant for granting an addition of $2\frac{1}{4}d.$ per diem to the subsistence of the non-commissioned officers and men; to this was afterwards added $3\frac{1}{4}d.$ per diem, making the pay of the private soldier $1s.$ per diem. In 1797, the stoppages from all the officers' pay called arrears, were abolished; besides which $1s.$ per diem was added to the subsistence of each subaltern officer. The pay of the surgeon and his mate (now assistant,) was also raised, the former to $10s.$ and the latter to $3s.$ a day. In our ancient armies there were, in addition to the regular stipend of the troops, certain allowances, called "regards" (rewards, Ducange.) Such there are, though under different appellations, at present. Among these we may notice the *non-effective* and *contingent* allowances to the captains of troops and companies. Formerly the captains received and kept the subsistence of the non-effective, or men wanting to complete their companies; but this becoming an enormous abuse, has been since restricted to $20l.$ for each captain per annum. The contingent allowance is proportioned to the strength of the company. There are besides other allowances to officers in general, such as bat, baggage, and forage money in camp, and lodging money in garrison, when there are no barracks. These allowances vary according to circumstances. For particulars, see Grose, ubi supra.

VOL. XXVI.

Full Pay denotes the pecuniary allowance which is made to officers and non-commissioned officers, without any deduction whatsoever. Since the abolition of arrears in 1797, commissioned and warrant officers, &c. (those belonging to the guards excepted,) receive their full pay, or daily subsistence. The private soldiers are subject to temporary deductions, for the purpose of appropriating part of their pay and allowances to the expence of their messes, including vegetables, &c. and to a stoppage not exceeding $1s. 6d.$ per week, for necessaries, which stoppage is to be accounted for every month; and the remainder being $1s. 6d.$ must be paid weekly to each soldier, subject to the accustomed deduction, for washing, and for articles to clean his clothing and appointments. The full pay of the British army is given in advance on the 25th of every month, and accounted for to government by the several district and regimental paymasters, through army agents appointed for that purpose. Non-commissioned officers and private soldiers, serving as marines, are not liable to any deduction whatever from their full pay, on account of provisions. Although the army is now paid its full pay, in consequence of the abolition of the distinction between subsistence and arrears, that pay is nevertheless subject to the usual deductions on account of poundage, hospital, and agency.

Half Pay is a compensation, or retaining fee, given to officers who have retired from the service through age, inability, &c. or who have been placed upon that list in consequence of a general reduction of the force, or a partial drafting, &c. of the particular corps to which they belonged. The half-pay becomes due on the 25th of June, and on the 25th of December in each year, but it is seldom issued until three months after the expiration of each of those periods. The only deduction from the half-pay is the poundage, $2\frac{1}{2} \text{ per cent.}$ The first time when this allowance occurs, is in a vote of the house of commons, January 18, 1697. As the officer when disbanded is rewarded with half-pay, so the private soldier in the cavalry has his horse, and an allowance for his sword given him, with fourteen days' pay to carry him home to any part of England: to any part of Scotland the allowance is twenty-one days' pay: and to any part of Ireland twenty-eight days' subsistence. The infantry likewise have the same allowance of pay for subsistence.

PAY-Master, is the person intrusted with the money, and that has the charge of paying it to the regiment. The payment of the land-forces is under the direction of an office, the business of which is conducted by the pay-master general, his deputy, cashiers, clerks, &c. The payment of the navy is under the direction of the treasurer of the navy, a pay-master, and accomptant, clerks, &c. There is also a pay-master of the pensions, &c. a pay-master of the marines, &c. district pay-master, &c. The army pay-office is at Whitehall: and the navy pay-office at Somerset-house.

PAY-Bills, bills belonging to the military department, which are distinguished according to the nature of the service for which they are given. Every captain of a troop or company receives a regular weekly account from his serjeant, of money to be advanced for the effectives of such troop or company; and on the 24th day in each month he makes out a monthly one for the pay-master, who makes out a general abstract for the agent. The pay-master-general's estimate is likewise called the pay-bill.

PAY-Lists, the monthly accounts which are transmitted by the several regimental and district pay-masters to their agents on the 25th of each month.

PAY-Serjeant. See SERJEANT.

To *PAY*, in *Sea Language*, is to daub or anoint the surface of any body, in order to preserve it from the injuries of the water, weather, &c. Thus the bottom of a ship is paid with a composition of tallow, sulphur, resin, &c. The sides of a ship are usually paid with tar, turpentine, or resin, or with a composition of tar and oil, to which is sometimes added red ochre, &c. in order to protect the planks from being split by the sun or wind. The lower masts are, for the same reasons, paid with the materials of the same sort, if we except those along which their respective sails are frequently hoisted and lowered; such are the masts of sloops and schooners, which are always paid with tallow for this purpose: for the same reason, all top-masts and top-gallant-masts are also paid with hog's-lard, butter, or tallow. Falconer. See SHIP and WOOD.

PAYA, in *Geography*, a town of South America, in the province of Darien; 30 miles E. of St. Marie de Darien.

PAYEE, in *Commerce*, the person to whom a bill is made payable.

PAYERNE, in *Geography*, a town of Switzerland, in the canton of Berne, formerly an imperial town, under the protection of the dukes of Savoy. It is governed by its own magistrates; 22 miles S.W. of Berne. N. lat. $46^{\circ} 51'$. E. long. $6^{\circ} 44'$.

PAYERSDORFF, a town of Germany, in the margraviate of Bayreuth, near which is a decayed castle; both which were taken by the Swedes under Gustavus Adolphus.

PAY-HO, or *PEI-HO*, a river of China, which rises in the north part of the province of Pe-tcheli, and runs into the gulf of Leao-tong. N. lat. $30^{\circ} 3'$.

PAY-HOU, a lake of China, in Pe-tcheli; 140 miles S. of Pe-king.

PAYJAN, a town of Peru, in the diocese of Truxillo; 15 miles N. of Truxillo.

PAYING-OFF, in *Sea Language*, denotes the movement by which a ship's head falls to leeward of the point where it was previously directed: particularly when, by neglect of the helmsman, she had inclined to windward of her course, so as to make the head-falls shiver in the wind, and retard her velocity.

PAYING-Off is likewise used to signify the payment of the ship's officers and crew, and the discharge of the ship from service, in order to be laid up at the moorings.

PAYING-Out, or *Paying-away*, is the act of slackening a cable, or other rope, so as to let it run out of the vessel for some particular purpose. See CABLE.

PAYMENT, the discharge of a debt, either by money really told, or by bills of exchange, &c. See DEBT, &c.

PAYMENT, *Prompt*, a popular term in England and Amsterdam. It is when a debtor acquits what he owes, before the expiration of the term granted by the creditor. The ordinary discount for prompt payment on most merchandizes, is one per cent.

PAYMENTS, *Equation of*. See EQUATION of Payments.

PAYMOGO, in *Geography*, a town of Spain, in the province of Seville, on the frontiers of Portugal; 35 miles N. of Ayanonte.

PAYNESVILLE, a town of America, in Trumbull county, state of Ohio, on lake Erie, near the mouth of Grand river; in 1802 it had about 150 inhabitants.

PAYO, Sr., a town of Portugal, in the province of Tras los Montes; 18 miles W. of Mirand-de-Duero.

PAYRA, a town of South America, in the province of Quito; 12 miles N.W. of Macas.

PAYRAC, a town of France, in the department of the Lot, and chief place of a canton, in the district of Gourdon. The place contains 902, and the canton 5171 inhabitants, on a territory of 140 kilometres, in 12 communes.

PAYROLA, in *Botany*, a name contracted by Jussieu from *Paypayrola* of Aublet, its Caribbean name.—Juss. 427. Lamarck Dict. v. 5. 118. Illustr. t. 125. (*Paypayrola*; Aubl. Guian. v. 1. 249. t. 99.)—Class and order, *Pentandria Monogynia*. Nat. Ord. uncertain.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, cloven into five, roundish, acute segments. *Cor.* Petals five, oblong, narrow, erect, united together, so as to resemble a tube, their tops reflexed; one larger, emarginate, inserted into the disk beneath the germen. *Stam.* Filaments five, erect, inserted into the disk; anthers oblong, combined, two-celled. *Pist.* Germen superior, placed on the disk; style elongated, stigma two-lobed. *Peric.* and *Seeds* unknown.

Obf. Aublet remarks that he never saw the fruit of this plant in its perfect state, but from an imperfect one, which he cut in halves, it appeared to have two cells.

Ess. Ch. Calyx inferior, five-cleft. Petals five, forming a tube, reflexed at their summit. Stigma two-lobed.

1. *P. guianensis*. Aubl. Guian. t. 99.—Native of woods in Guiana, about Sinemari, upwards of twenty miles from the sea. It flowers in October.—This is a shrub from twelve to fifteen feet in height, whose stem is upright and branched. *Leaves* alternate, stalked, large, ovate, acute, smooth, entire. *Stipulas* two, short, acute, deciduous. *Flowers* spiked, axillary, terminal, yellow, each furnished with three glands at its base.

PAYS, RENE LE, in *Biography*, a writer of celebrity, born at Nantz in 1636, was brought up to business, and obtained the post of director-general of the gabelles in Dauphiné and Provence. He was first known in the literary world in 1685, by a little production in verse and prose, entitled "Amitiés, Amours, et Amourettes," which was read with great avidity at Paris. It is said that in answer to some enquiries made by ladies as to his person, he addressed to the duchess of Nemours a "Portrait" of himself, written in the same style. He professed to imitate Vouture, but was severely criticised by Boileau as a very inferior writer. Le Pays, however, instead of being offended with the satire, paid a visit to the poet, and obtained his friendship. He published letters, which prove that he had visited England and Holland. He was honoured by the duke of Savoy with the knighthood of St. Michael, and was an associate of the academy of Arles. He died in 1690, at the age of fifty-four.

PAYTA, or *PAITA*, or *St. Michel de Payta*, in *Geography*, a town of Peru, in the diocese of Truxillo, founded by Francis Pizarro, in the year 1531. It is small, consisting of houses that are constructed of split canes and mud, covered with leaves, and one story high; the only exception being that of the governor, which is built of stone. It has a parish-church and chapel, dedicated to our Lady of Mercy. The inhabitants are chiefly Spaniards, Mulattoes, and Mestizoes, who live chiefly by passengers going or returning from Panama to Lima, the number of whites being inconsiderable; all of them constituting about one street, and about 172 houses, and 35 or 40 families. The port, though little more than a bay, is esteemed the best on the coast, and affords a secure anchoring-place. This is the only place where ships from Acapulco, Sonsonate, Panama, &c. can touch in their passage to Callao. The voyage is long and tedious, on account of contrary winds, rains, and shifting

ing currents : so that, though the distance, according to the latitude of these ports, is only 140 leagues, a ship is very fortunate in performing it in 40 or 50 days, and in not being obliged to return to Païta. Southward of the town is a mountain, called from its figure Silla de Païta, or the saddle of Païta. The soil round the town is wholly sandy, and very barren : for besides the total want of rain, it has not a single river for the conveyance of water, of which it would be entirely destitute, if it were not supplied every day with great fatigue from Colan, a town on the same bay, four leagues N. of Païta, near which runs the river Chera, which waters Amotape. The Indians of Colan are obliged to send daily to Païta one or two balzes, loaded with water, which is distributed in stated proportions among the inhabitants. Païta has also the greatest part of its provisions from the same town. The nature of the soil and the situation of the place render it extremely hot. The town owes its whole support to the harbour, which is the place, as we have already intimated, where the cargoes of goods sent from Panama are landed, together with those coming from Callao to the jurisdictions of Piara and Loja. In the bay of Païta, and also that of Sechura, little farther to the south, there is an ample fishery, in which the Indians of Colan, Sechura, and the small hamlets near the coast, are constantly employed. The whole defence of the town consists in a small fort encompassed by a brick wall, and mounted with about eight pieces of cannon, but it has neither ditch, nor outwork. It has been often taken by the English, and particularly in 1741 by the squadron of commodore Anson, when it was pillaged and burnt. S. lat. 5° 10'. W. long. 81° 6'.

PAYTOLLEE, a town of Hindoostan, in Rohilcund ; 7 miles E. of Biffowie.

PAZ, LA, a province and diocese of Peru, belonging however to the viceroyalty of Buenos Ayres. This diocese contains six jurisdictions, viz. La Paz, Omasuyos, Pacajas, Laricaxa, Chucuito, and Paucar-colla, which see respectively. The jurisdiction of La Paz is of no great extent ; and the city is almost the only place in it that is worthy of any notice. In the adjacent cordillera is a high mountain, called Illimani, which is supposed to contain immense riches ; but its summit being perpetually covered with ice and snow, no mine has been opened in this mountain. This province was formerly known by the name of Chuquiyapu, which in the idiom of that country, is commonly thought to signify Chacra, or an inheritance of gold, and is there corruptly called Chuquiabo.

PAZ, La, a considerable city, and capital of the above province, having, according to Helms, more than 4000 hearths, or 20,000 inhabitants. It is an elegant and clean town, chiefly trading in the noted tea of Paraguay. The province was first conquered by Mayta-Capac, the 4th Inca ; and the Spaniards having afterwards taken possession of it, this city was founded by Pedro de la Gasca, in order to secure a settlement of Spaniards, in the extensive interval of 170 leagues between Arequipa and Plata, for the improvement of commerce, and the convenience and safety of the traders. Its situation was selected in a valley called Las Pacafas, in October 1548, as a place abounding in grain and cattle, and full of Indians. Along the valley of La Paz flows a pretty large river, occasionally much increased by torrents from the Cordillera, about 12 leagues distant from the city ; but from its vicinity, a great part of the country is exposed to so cold an air, that hard frosts, snow, and hail are not uncommon ; but the city itself is secured from them by its happy situation. Other parts are so well sheltered, that they pro-

duce all the vegetables of a hot climate, as sugar-canes, cocoa, maize, and the like. In the mountainous parts are large woods of valuable timber, but infested with bears, tigers, and leopards, with a few deer ; while on the heaths are found guanacos, vicunas, and blamas, with a great number of cattle of the European species. The city stands on unequal ground, among the branches of the Cordillera, and is surrounded by mountains. When the river in its vicinity is increased, either by rains or by the melting of the snow on the mountain, its current forces along large masses of rocks, with some grains of gold, which are found after the flood has subsided, and from which some idea may be formed of the riches inclosed in the bowels of these mountains. In the year 1730, an Indian accidentally discovered a lump of gold of so large a size, that the marquis de Castel Fuerte gave 12,000 pieces of eight for it, and sent it to Spain, as a present worthy of his sovereign. This city is governed by a corregidor, under whom are regidores, and ordinary alcaldes, as in all other towns. Besides the cathedral and the parish church, there are three others ; and also religious fraternities of Franciscans, Dominicans, Augustines, the fathers of Mercy, a college of Jesuits, and a convent and hospital, together with two nunneries. Here is also a college of St. Jerom, for the education of youth, whether designed for civil or ecclesiastical employments ; 120 miles E.S.E. of Arequipa. S. lat. 17° 15'. W. long. 68° 36'.

PAZARO, a cape of North America, on the W. side of the peninsula of California, near to the south end of it, in about N. lat. 24°, and W. long. 113°.

PAZMANI, PETER, in *Biography*, a celebrated cardinal, who flourished in the 17th century, was descended from a noble Transylvanian family. The time of his birth is not known, but he entered the order of Jesuits in the year 1587, and distinguished himself by the progress which he made in the different branches of literature, sacred and profane. In the year 1607, he was appointed professor of philosophy, and afterwards of divinity at the college of Gratz, in Styria, in which posts he acquitted himself with universal satisfaction. He afterwards devoted himself to missions in different parts of the kingdom, and was thought to have laboured very successfully in opposing the progress of the reformed opinions. By his zeal he recommended himself to the emperor Matthias, and the principal Hungarian nobility, and was appointed to the archbishopric of Gran, or Strigonia, an office that he did honour to by the establishment of strict discipline, and correcting the relaxed manners of the Hungarian clergy. He founded colleges at Presburg, Posen, and other places, for the encouragement of literature. In 1629 he was promoted to the high dignity of cardinal, by pope Urban VIII., at the solicitation of the emperor Ferdinand II. By the same prince he was afterwards sent ambassador to the court of Rome. He died at Posen in 1637, while on his journey towards Vienna, to attend on the councils of the emperor Ferdinand III. He was author of "Acta et Decreta Synodi Diocesanæ Strygoniensis, celebratæ Tyrnauiz." "Sermons on the Gospels for all the Sundays, and several of the Festivals, throughout the Year," in the Hungarian language. "A Collection of Prayers," in the same language, which has undergone numerous impressions ; and a great number of doctrinal, practical, and controversial treatises, in Hungarian and Latin. Moreri.

PAZZANO, in *Geography*, a town of Naples, in Calabria Ultra ; 19 miles N.N.E. of Gierace.

PEA, in *Botany*, &c. See LATHYRUS, LOTUS, and PISUM.

PEA, in *Agriculture*, a sort of plant or pulse generally cultivated

cultivated as a field crop. It is a sort of crop which is often supposed to be less advantageous to the farmer than several others; but in many situations and circumstances of land, it will be found highly beneficial to the cultivator, from its ameliorating and cleaning properties.

The species and varieties of pease are very numerous; but those employed in field culture are distinguished into two kinds, the early and late; the chief of the former of which are the *early charlton*, the *golden hotspur*, and the *common white forts*; and of the latter the various kinds of grey pease, as the *marleborough grey*, the *horn grey*, and the *purple grey*; but the marleborough is the most commonly made use of by most farmers.

Soil.—Pease are a crop that are grown upon almost any sort of soil, but which answer best on those that are dry, and free from stagnant moisture, and which are in a good state of mellowness, and impregnated with calcareous materials. But “all the sorts of early pease should, according to Mr. Young, be cultivated on dry soils only. They will grow on moist, and even wet ones; but the crop is seldom beneficial. Upon sands, dry sandy loams, gravels, and chalks, they succeed well. They are not, however, to be much recommended on land in tith. Great success is rarely commanded, especially in a wet season, if they be not on a layer.”

It is a sort of crop cultivated after many different kinds, as almost all those of the grain description, as well as clover, sainfoin, and on old lays newly broken up from sward. But Mr. A. Young has well remarked, that “a farmer desirous of keeping his land always in good and clean order, should, in the arrangement of his crops, take great care not to be too free with wheat, barley, and oats, which are all exhausting plants. He should sow beans and pease enough, because they are ameliorating ones, and admit hand-hoeing, to kill the weeds. In those fields in which the common husbandmen sow oats or barley, after wheat, or after each other, let the good cultivator substitute pease or beans, or some other ameliorating crop, which will pay him better than white corn, under such circumstances, and at the same time keep his land clean. Pease may be sown, like black oats, on turf ploughed up before winter, and harrowed in.” He further remarks, “on the culture of pease, that bad farmers are too apt to sow this pulse when the land will yield nothing else. They have a proverb among them, which signifies, that the season does as much for pease as good husbandry; and they from thence take care that good crops shall be owing to season alone. Hence arises the general idea of pease being the most uncertain crop of all others. This is owing to their being scarcely ever sown on land that is in good order. Let the good husbandman lay it down as a maxim, that he should sow no crop on land that is not in good order; not merely in respect of fine tith at the time of sowing, but also of the soil’s being in good heart, and clear of weeds. He would not, however, here be understood to rank all these crops together, because beans and pease will admit of cleaning while they grow. On that account, if a farmer comes to a field which his predecessor has filled with weeds, a horse-hoed crop of beans will be expedient, when a barley crop would be utterly improper, and, after land has yielded one crop of barley, certainly another should not be sown, but one of pulse substituted. If these ideas are well executed, the pease and beans, in every course, will find the land in heart enough for barley, the soil will always be clean, and the crop good. Pease, when managed in a spirited manner, will not have the reputation of being so very uncertain a crop,

which character has, in some measure, been owing to ill conduct.”

And the same writer thinks, that the following courses do well for them:

- | | |
|-----------------------|---|
| “ 1. Turnips, | Also, 1. Turnips, |
| 2. Barley, | 2. Barley, |
| 3. Clover, | 3. Seeds for two, three, or more years, |
| 4. Pease and turnips, | 4. Pease and turnips, |
| 5. Barley, | 5. Barley, |
| 6. Carrots, | 6. Beans, |
| 7. Barley, | 7. Wheat.” |
| 8. Clover, | |
| 9. Wheat. | |

It is stated, that “there is a remarkable circumstance observed by that excellent husbandman, Mr. Overman of Norfolk, relative to pease, which should be in the mind of every farmer fond of a pea crop. It is, that they do not succeed well, if sown oftener than once in ten or eleven years; and he has heard it more generally observed by others, that pease should not be sown so often.”

In regard to manuring for this crop, it is observed, that “it is the practice with some farmers to manure for them. But he must confess that he has been always so much against it, that he never did it himself, and therefore can only state his reasons for avoiding it. If land is in heart, and they are put in on a layer, they do not want manure. A very good crop may be gained without it. He has had five, and even five and a half quarters an acre, without any manure applied for this crop. Dung makes them run to long straw, and that is not favourable for podding productively. Dung encourages weeds; and pease, except in the early stage of their growth, do not admit of such hoeing as a farmer would wish to give. Beans cannot have too much dung, but with pease the case is different. There are few situations in which the farmer can have such a command of manure to give him a sufficiency. It is, therefore, of much consequence to him, never to spread a load but where it will be sure to answer best. Every man complains of a want of dung; how very careful, therefore, ought all to be, to give it to the crops that will pay best for the expence.” But notwithstanding these useful remarks, manure may in many cases be employed with advantage for crops of this kind, and in some they cannot probably be grown without it to advantage.

Time of Sowing, and Quantity of Seed.—The time of putting this sort of crops into the ground differs considerably, according to the intentions of the cultivator. When they are grown for podding early for sale green, they should be sown at different times, from January to the end of March, beginning with the driest and most reduced sorts of land. And in this intention, in some southern counties, they are put in in the autumn. But for the general crops, from February to April, as soon as the lands can be brought into proper order, is the proper season; the grey forts being employed in the early sowings, and the white forts in the later. Mr. Young says, that where the crops cannot be put in in February, they should always be completed in the following month. And that, in sowing on layers, that “the white boiling pea, of many sorts, and under various names, is more tender than the greys, and various kinds of hog pease; but he has many times put them into the ground in February, and though very smart frosts followed, they received no injury. He has uniformly found, that the earlier they were sown the better. There is also a particular motive for being as early as possible; that is, to get them

on in June for turnips. This is most profitable husbandry, and should never be neglected. If they are sown in this month, and a right sort chosen, they will be off the land in June, so that turnips may follow at the common time of sowing that crop."

It is evident that the quantity of seed must be different in different cases and circumstances, and according to the time and manner in which the crop is put into the ground; but in general, it may be from two and a half to three bushels, the early sowings having the largest proportion of seed. In planting every flag, Mr. Young says, two bushels and a half is the usual proportion; but when drilled at greater distances, six or seven pecks will answer in most cases.

Methods of Sowing.—There are different practices pursued in putting this sort of crop into the soil: Mr. Young remarks, that in common management they are sometimes ploughed, and at others harrowed in, circumstances which often make a difference in the crops, as where the land is apt to bind with rain, and the pease are ploughed in, they sometimes do not come up at all, not having strength to pierce the plastered surface. But this is an evil that attends only the very binding soils with late sowing. On the other hand, when the seed is only harrowed in, where the land is not very well guarded, much devastation will be committed by the pigeons, and other birds, for which allowances should be made. It is supposed, that where the lands harrow well, all should be harrowed in, except on the lightest lands. But on these, such as loose sands, and other very porous and dry soils, it is a preferable practice to plough them in, as they have a greater depth, and are of course less liable to burn in hot summers.

It has been remarked, that it is usual, in these cases, in many districts, to put the seed into the ground in the broad-cast method; but the drill, or row system, is mostly to be preferred, as being more regular, saving considerably in the proportion of seed, and admitting of cultivation afterwards with more ease and advantage. And that different implements have been contrived for this use, but the most convenient is probably a small light sort of wheel-plough, to the body of which a sort of seed-box is attached, through the bottom of which the axis of a light wheel passes, by which the sowing is regulated, and which is pulled up and prevented from letting the pease be deposited at the ends of the ridges, or other places, as in turning, by a string attached to the handle. It may be conveniently employed with one or two horses. In regard to the rows, it is observed, that the proper distance of drilling this kind of crop is mostly about twelve or sixteen inches for hand-hoeing; but where the horse-hoe is employed, from two to three feet; and the depth to which the seed is deposited from two to three inches. And that, in some districts, the seed is put by the hand into drills mostly made crossways of the ridges, but occasionally in the direction of them at the distance of about fifteen inches from each other, and afterwards covered in by means of hoes. In some instances, also, a bush-harrow is drawn over the surface, by which the land is rendered smooth and even. But where this sort of crop is cultivated on a lay preparation, the best method is probably to dibble the seed in. This is the practice constantly followed by the best cultivators in some districts in Middlesex. Mr. Young, however, advises, that broad-cast pease should be utterly rejected in every case. The only question that can arise in their culture, is between drilling and dibbling. If the former is determined on, the land should have been ploughed late in autumn, with Duckett's skin coulter, into lands adapted to the drill-machine and scarifiers. The surface

being then worked shallow, in this month drilling should directly follow. If dibbling is determined on, the land should not be ploughed till the time of planting, and a heavy roller follow the plough. On lighter soils, if the frost has worked the surface, after ploughing, the ground will be in too friable a state, the holes will moulder in, and the seed will be laid too shallow. Dibbling pease on a layer cannot be too much commended. It is an excellent practice in most cases.

But in respect to the rows, the practice of various farmers differs exceedingly. Equi-distant rows, from nine to eighteen inches, are common. He has seen them at two feet, and even three. In dibbling, it is common in Norfolk and Suffolk to put in three rows, on every flag of nine or ten inches breadth; some farmers one row on such a furrow: and he has known very good crops in most of these distances. If horse-hoeing is intended, double rows at nine inches, with intervals of eighteen, do well: but the greatest crops have been from planting every flag.

It has been suggested, that, though the practice of steeping this sort of seed is seldom had recourse to by the cultivators of pease, it is probable that the later sown crops may be greatly benefited by it, as the vegetation of the plants may be rendered more quick, regular, and uniform. And in the *Maifons Rustiques*, the same practice is approved of, not only to separate the bad and faulty, but to enable the crop to rise sooner.

It is the custom in Hertfordshire, and some other districts, to sow beans, or even oats, sometimes with the pease, with a view of keeping them up. These mixtures should, however, never be adopted, as the different crops, from their being of an unequal growth, must constantly be liable to injure each other while they are growing on the land.

Culture while Growing.—There can be no doubt but that the use of the hoe in stirring the intervals, and earthing up the young plants where the crop has been put in in rows by the drill or dibble, is of essential advantage in promoting their growth, and protecting them from the injuries of the season. Where the method of hand-culture prevails, it is the general custom to have recourse to two hoeings; the first, when the plants are about two or three inches in height, and again just before the period in which they come into blossom. In this way the vigorous vegetation of the young crop is secured, and a fresh supply of nourishment afforded for the setting of the pods and the filling of the pease. At the last of these operations, the rows should be laid down, and the earth well placed up to them, the weeds being previously extirpated by hand-labour. In some parts of Kent, where this sort of crop is much grown, it is the practice, when the distance of the rows is sufficiently great, to prevent the vegetation of weeds, and forward the growth of the pea crops, by occasionally hedge-hoeing, and the use of the break-arrow, the mould being laid up to the roots of the plants at the last operation, by fixing a piece of wood to the arrow. This should, however, only be laid up on one side, the pease being always placed up to that which is the most fully exposed to the effects of the sun. The hedge-hoeing is performed at the rate of from two to three shillings the acre, according to the nature of the land. These sorts of crops can never be kept too clean, therefore the greatest attention should be paid to them.

It has been stated that there are many inducements to the cultivation of this crop, on suitable soils in the vicinity of large towns, where the demand for green pease is considerable; such as the ready supply of money, that is thus provided for the other expensive operations during the summer

mer months, the facility of thus rendering the land proper for the growth of turnips, and the large supply of fodder that is afforded by the stems of the plants when properly secured; notwithstanding the danger of such crops during the winter, and even in the spring months, when the season proves unfavourable, and the heavy expences incurred in the gathering and disposal of them. And that it is frequently a practice with the large cultivators of early green pea crops, in the neighbourhood of London, to dispose of them by the acre to inferior persons, who procure the podders; but the smaller farmers for the most part provide this description of people themselves, who generally apply at the proper season for the purpose. The business of picking or podding the pease is usually performed by the labourers at a fixed price for the sack, of four heaped bushels. The number of this sort of persons is generally in the proportion of about four to the acre, the labour proceeding on the Sundays as well as other days. It is sometimes the custom to pick the crops over twice, after which the rest are suffered to stand till they become ripe for the purpose of feed. This, however, mostly arises from the want of pickers, as it is considered as a loss, from the pease being less profitable in their ripe state than when green. Besides, they are often improper for the purpose of feed, as being the worst part of the crop. It is therefore better to have them clear picked, when the hands can be procured. After this they are loaded into carts, and sent off at suitable times, according to the distance of the situation, so as to be delivered to the salesmen in the different markets from about three to five o'clock in the morning. In many cases in other parts the early gatherings are, however, sent to the markets in half-bushel sieves, and are frequently disposed of at the high price of five shillings the sieve; but at the after periods they are usually conveyed in sacks of a narrow form, made for the purpose, which contain about three bushels each, which, in the more early parts of the season, often fetch twelve or fourteen shillings the sack, but afterwards mostly decline considerably, in some seasons so much as scarcely to repay the expences. This sort of crop affords the most profit in such pea seasons as are inclined to be cool, as under such circumstances the pease are most retarded in their maturation or ripening, and of course the markets are kept from being over abundantly supplied. With respect to the expence attending the gathering of green pease, it is different according to the difficulty of procuring podders, the bulk or abundance of the crops, and the kind of pea, or size of the pods. Those of the larger sorts, such as the marrowfats, being in the county of Middlesex about one shilling, and those of the smaller kinds, as the charlton, from fifteen to eighteen pence the sack. In Kent, the usual price is about fourteen-pence the sack for podding, one shilling for conveying them to the market, and three-pence the sack for the salesman. It is obviously only in the vicinities of large towns, that the system of green pea management can be carried on with the prospect of much profit; in other cases it will be better to take regular field crops in the usual way. These prices stand much higher at present.

It is further stated, that the quantity of produce of both the early and late pea crops varies much according to the nature of the season, and many other circumstances. The average of the early crops in Middlesex is supposed to be from about twenty-five to thirty sacks the acre. The author of the Synopsis of Husbandry, however, states the produce about Dartford, in the county of Kent, at about forty sacks the acre, though fifty have sometimes been gathered from that space of land.

In the county of Middlesex, Mr. Middleton has stated the expences and produce in cultivating a field of six acres in the year 1796 to stand as below, though it was not remarkable for more than a common crop.

Expences of Preparation.

	£	s.	d.
Ploughing once from clover lay	-	-	0 10 0
Seed four bushels, at 12s.	-	-	2 8 0
Drilling and covering in, &c.	-	-	0 7 0
Hoeing twice	-	-	0 10 0
Podding <i>per</i> sack 18d. on 40 sacks	-	-	3 0 0
Marketing, distance 10 miles; land carriage	-	-	1 5 0
			<hr/> 8 0 0

Produce of Crop.

	£	s.	d.
Forty sacks, of four bushels each, of pods } for market, at from 6s. to 13s. average 7s. } but at 6s. each - - - - - }			15 0 0
Haulm, stacked for giving to draught horses, } one ton <i>per</i> acre, worth two-thirds as much } hay, but suppose only - - - - - }			3 0 0
			<hr/> 18 0 0

The advantage in this case ten pounds.

And in the latter crops, that stand to ripen, it is supposed by some to be from three and a half to four quarters the acre; others, however, as Mr. Donaldson, imagine the average of any two crops together not more than about twelve bushels. And that on the whole, if the value of the produce be merely attended to, it may be considered as a less profitable crop than most others. But as a means of ameliorating and improving the soil, at the same time, it is however to be esteemed as of great value.

The greatest danger to the early pea crops is to be apprehended, when the weather during the more early spring months is hot and sunny in the day-time, attended with sharp frosts in the night, as in this way great mischief is often done; the crops becoming attacked with the mildew, and not ripening in a proper manner. And, while the pease are proceeding in their growth, and still more particularly at the periods when they come into blossom and begin to set their pods, it is of great importance to have rather moist weather, as by that means the vegetation of the crop is promoted in a more perfect manner, and there is a greater chance of the peas being well podded. The chief signs of the healthy and vigorous vegetation of pea crops are those of their leaves possessing a fine bloom of a bluish cast, and having the outermost large leaves of the blossom extending backwards in some degree.

As the pea crops become ripe, they wither and turn brown in the haulm or straw, and the pods begin to open. In this state they should be cut as soon as possible, in order that there may be the least loss sustained by their shedding. In the late or general crops, after they are reaped, or rather cut up by means of a hook, it is the usual practice to put them up into small heaps, termed wads, which are formed by setting small parcels against each other, in order that they may be more perfectly dried both in the seed and stem, and be kept from being injured by the moisture of the ground. But in the early crops the haulm is hooked up into loose open heaps, which, as soon as they are perfectly dry, are removed from the ground and put into stacks for the purpose of being converted to the food of animals, on which

which they are said to thrive nearly as well as on hay. When intended for horses, the best method would seem to be that of having them cut into chaff and mixed with their other food. Mr. Young asserts, that forward white peas will be fit to cut early in July; if the crop is very great, they must be hooked; but if small, or only middling, mowing will be sufficient. The stalks and leaves of peas being very succulent, they should be taken good care of in wet weather: the tufts, called wads or heaps, should be turned, or they will sell but indifferently, as the brightness and plumpness of the grain are considered at market more than with hog-peas. The straw also, if well harrowed, is very good fodder for all sorts of cattle and for sheep; but if it receives much wet, or if the heaps are not turned, it can be used only to litter the farm-yard with.

It is the practice in some districts to remove the haulm, as soon as it has been cut up by hooks, constructed with sharp edges for the purpose, to every fifth ridge, or even into an adjoining grass field, in order that it may be the better cured for use as cattle food, and at the same time allow of the land being immediately prepared for the succeeding crop. What are usually termed winter peas, or such crops as have been sown in the autumn, generally afford the largest proportion of cattle fodder, when properly managed in the securing of it.

Mr. Bannister states, that if wet weather happens whilst the peas lie in wads, it occasions a considerable loss, many of them being shed in the field, and of those that remain, a great part will be so considerably injured, as to render the sample of little value. This inability in peas to resist a wet harvest, together with the great uncertainty throughout their growth, and the frequent inadequate return in proportion to the length of haulm, has discouraged many farmers from sowing so large a season of this pulse as of other grain; though on light lands which are in tolerable heart, the profit, in a good year, is far from inconsiderable.

It is thought by some of considerable importance in the economy of a farm, when the nature of the soil is suitable, to have recourse to the early sorts; as by such means, the crops may in many cases be cut and secured, while there is leisure, before the commencement of the wheat harvest. And, that where the nature of the soil is dry and warm, and the pea crop of a sufficiently forward kind, it may be easy to obtain a crop of turnips from the same land in the same year, as has been suggested above. But in this view it is the best practice to put the crops in in the row method, and keep them perfectly clean by means of attentive hand and horse-hoeing; as in that way the land will be in such a state of preparation for the turnips, as only to require a slight ploughing, which may be done as fast as the pea crop is removed, and the turnip seed harrowed in as quickly as possible upon the newly turned up earth. In some particular districts a third crop is even put into the same land, the turnips being sold off in the autumn and replaced by collards, for the purpose of greens in the following spring. This, according to Mr. Middleton, is the practice in some places in Middlesex. But it is obviously a method of cultivation that can only be attempted on the warm and fertile kinds of turnip soil, and where the pea crops are early; on the cold heavy and wet descriptions of land, it is obviously impracticable, and wholly improper.

It is stated by a practical writer, that with the marrowfat and other late sorts of peas, the usual practice is either to prepare the land for wheat, or to put in crops of favours or other late sorts of cabbages, which are the methods of husbandry that may often be had recourse to, even on the more heavy sorts of land, with success. And that from pea

crops rendering the lands, on which they are cultivated, more light, open, and porous, they are supposed to be less proper for preceding wheat, than those of beans; on the more stiff sorts of ground, this cannot, however, be an objection of any great consequence, and even on the lighter kinds it may often be obviated, by giving the seed earth early, so that the crop may be put in upon a stale furrow, by the use of the sheep-fold, either immediately before or after the grain is deposited in the soil, and by repeating the same practice occasionally afterwards, as well as by rolling.

Application of Crops.—It is stated, that the portion of peas, that is not consumed as human food, is mostly appropriated to the purposes of fattening hogs and other sorts of domestic animals; and, in particular instances, supplies the place of beans as the provender of labouring horses; but that care should be taken, when used in this way, that they be sufficiently dry, as, when given in their green state, they are said to be apt to produce the gripes and other bowel complaints in these animals. And Mr. Bannister, after observing that the straw is a very wholesome food for cattle of every kind, suggests, that there is generally a considerable demand for peas of every denomination in the market, the uses to which they may be applied being so many and so various. The boilers, or yellow peas, always go off briskly; and the hog peas usually sell for sixpence or a shilling per quarter more than beans. For feeding swine the pea is much better adapted than the bean, it having been demonstrated by experience, that hogs fat more kindly when fed with this grain than on beans; and, what is not easy to be accounted for, the flesh of swine, which have been fed on peas, it is said, will swell in boiling, and be well tasted; whilst the flesh of the bean-fed hog will shrink in the pot, the fat will boil out, and the meat be less delicate in flavour. It has, therefore, now become a practice with those farmers who are curious in their pork, to feed their hogs on peas and barley-meal, and if they have no peas of their own growth, they rather choose to be at the expence of buying them, than suffer their hogs to eat beans. Nay, so far do some of them carry their prejudice in this particular, as to reject the grey peas for this use, as bearing too great an affinity to the bean, and therefore reserve their growths of white peas solely for hog-fattening.

Peas, if the ground is kindly for their growth, and the summer moist, generally produce a great abundance of haulm, which takes up a large space in the barn, and for this reason the mow ought always to be trodden with hogs or horses, or in some better way, which will close down the haulm into one-sixth part of the compass it would otherwise have occupied. In Leicestershire they set all their peas abroad in stacks, being persuaded that they thence acquire a much better colour than when housed in the barn.

Malted peas have been found to answer well in the fattening of hogs and turkeys, as well as in the feeding of horses in some cases.

Sowing of Seed-peas.—In the sowing of any particular sorts of peas for feed, they should be carefully looked over while in flower, in order to draw out all such plants as are not of the right sort; as there will always be, in every sort, some roughish plants, which, if left to mix, will degenerate the kind. As many rows as may be thought sufficient to furnish the desired quantity of seed should then be marked out, and left till their pods turn brown, and begin to split, when they should immediately be gathered up with the haulm; and if the farmer has not room to stack them till winter, they may be threshed out, as soon as they are dry,
and

and put up in sacks for use: but particular care should be taken not to let them remain too long abroad, after they are ripe; as wet would rot them; and heat, after a shower of rain, make their pods burst in such a manner that the greater part of their seeds would be lost.

PEA, *Chich*. See CICERO.

The chich pea is much cultivated in Spain, being an ingredient in their dyes, and is there called *garavance*. It is cultivated in France also, but in England it is rarely sown; and unless the season proves warm and dry, the plants decay before the seeds ripen. Miller.

The ancient Hebrews made use of chich peas as their common provisions, when they took the field. They parched them to eat. At this day in Egypt, when people undertake a journey, they lay in a good stock of chich peas, parched in a frying-pan. Bellonius assures us, that at Grand Cairo, and Damascus, there are abundance of shops, where people do nothing else but fry peas, it being a sort of provisions with which they furnish travellers. In Ethiopia they take barley with them, roasted in the same manner. In Turkey they lay in a stock of rice on these occasions, which they prepare and shell. The Hebrew term *שן*, signifies properly any thing roasted in general, and by it is understood roasted peas, rice, or barley; some will have even coffee to be meant by it. Bellon. lib. ii. cap. 53. Calm. Dict. Bibl.

PEA, *Everlasting*, or earth-nut pea, names sometimes given to the lathyrus. See LATHYRUS.

PEA, *Everlasting*, in *Agriculture*, a plant of the vetch kind, that may be sometimes cultivated. This is probably another plant of the pea kind that may be cultivated with great advantage as green food for animals.

Mr. Weston has observed, that tares and vetches are plants of which horses are very fond, and are cultivated with great advantage for that purpose. The everlasting peas belong to the same class of plants; are much more luxuriant in their growth, and yet are not cultivated, except for ornament. These plants are well known, and may be found in the gardens of almost every village in the kingdom. The luxuriance of their growth is so great, that the narrow-leaved, lathyrus sylvetris, grows to the height of five or six feet, the other, lathyrus latifolius, to eight, ten, or more. They begin to vegetate early in the spring, and continue growing until severe frosts stop them. Another peculiar advantage belonging to them is, that they are perennial-rooted plants, and when once sown, improve in their vigour and growth after the first year, and continue increasing for several successive ones, as may readily be proved by examining the gardens in which they are to be found, where seed may be had, and tried at first upon a small scale, with very little trouble and expence, and afterwards increased. A rood of land, light, and but poor in quality, was sowed with it early in the spring; the land prepared as for barley. A slight furrow was drawn with a light plough, and the seed thinly dropped into it. Another was drawn at a foot distance, and the seed dropped in like manner. An interval was then left at least two feet wide; then two more rows, till the whole was sown. The seed was afterwards covered by drawing a light harrow, with wooden tines, backwards and forwards across the land. When the plants came up and grew a little strong, they were thinned with a hoe to a foot distance, that they might have room to spread and branch. The first year they made no great quantity of fodder, but have since made ample amends.

The second spring they came up very strong and vigorous, branching out very much. A couple of horses were turned into feed, who were very fond of them, eating them very

greedily, though they were taken out of a good natural upland pasture. The third year the land was almost entirely covered, and it yielded a great deal of food. For experiment a few rods were mowed just before it flowered, which made good hay, sweet without being sticky.

It is noticed, that this experiment is not described longer than the three first years. Instead of destroying the plants by hoeing them where too thick, he would recommend them to be drawn out, and a fresh plantation made with them. In gardens, they are generally transplanted from the seed beds the second spring. And instead of turning horses into feed, he would prefer cutting them either with a scythe or sickle, and have them given to the horses. It would certainly by that method produce more fodder, and you could find how many times in the summer they would bear cutting, and at what height it is the most advantageous to cut them. If the intervals be left three feet wide, instead of two, there would be room to plant in September and October a winter crop, when the peas cease growing, as borecole, cabbage plants, &c. which would occupy the ground till March, at which time they begin to vegetate.

Others have found much advantage from this plant in the fattening of cattle in some of the western counties.

PEA *Flowers*, in *Botany*, see DIADELPHIA, LEGUMINOSÆ, and PAPILIONACEOUS *Flowers*.

PEA, *Heart*, or *Bladder*. See CARDIOSPERMUM.

PEA, *Indian*, or *Heath*, the name by which a species of orobus is sometimes called. See OROBUS.

PEA, *Painted Lady*. See LATHYRUS.

PEA, *Pigeon*, a name sometimes given to the *cytusus*; which see.

PEA, *Scarlet*, the English name of a genus of plants, called by Linnæus *glycine*; which see.

PEA, *Sweet-scented and Tangier*. See LATHYRUS.

PEA, *Winged*, a name by which some call the *lotus*; which see.

PEA, *Wild-winged*, a species of the *pisum*; which see.

PEA, *Wood*. See OROBUS.

PEACE, PAX, in its general signification, stands in opposition to *war*. The right of making war and peace is one of the prerogatives of the king. In order to make a war completely effectual, it is necessary with us in England, that it be publicly declared, and duly proclaimed by the king's authority; and then all parts of both the contending nations, from the highest to the lowest, are bound by it. And wherever the right resides of beginning a national war, there also must reside the right of ending it, or the power of making peace. And the same check of parliamentary impeachment, for improper or inglorious conduct, in beginning, conducting, or concluding a national war, is in general sufficient to restrain the ministers of the crown from a wanton or injurious exertion of this great prerogative.

PEACE, in our *Law Books*, &c. is restrained to a quiet and inoffensive carriage towards the king, and his people. Lamb. Eirenarch.

Offences against the public peace are either such as are an actual breach of the peace; or constructively so, by tending to make others break it. Both of these species are either felonious, or not felonious. The felonious breaches of the peace, are strained up to that degree of malignity by virtue of several modern statutes; and, particularly, the "riotous assembling" of 12 persons or more, and not dispersing upon proclamation; "unlawful hunting" in any legal forest, park, or warren, not being the king's property, by night, or with painted faces, 1 Hen. VII. c. 7, or appearing with the face blacked, or with other disguise, and being armed with offensive weapons, to the breach of the public peace, and the

terror

terror of his majesty's subjects, 9 Geo. I. c. 22:—sending any letter without a name, or with a fictitious name, *demanding* money, &c. or *threatening* to kill any of his majesty's subjects, or to fire their houses, &c., 9 Geo. I. c. 22. 27 Geo. II. c. 15:—destroying any *lock*, *sluice*, or *floodgate*, &c. *turnpike-gate*, &c. The above-mentioned offences are felonies. Those that remain to be enumerated are merely misdemeanors; *viz. affrays*, *riots*, *routs*, and *unlawful assemblies*, consisting of at least three persons; *tumultuous petitioning*; *forcible entry or detainer*; *riding or going armed*, with dangerous or unusual weapons; *spreading false news*; *false and pretended prophecies*. Besides actual breaches of the peace, any thing that tends to provoke or excite others to break it, is an offence of the same denomination; such are *challenges to fight*, either by word or letter, or *bearing such challenge*; and *libels*. See each article.

The English laws have provided various means for preventing offences against the public peace. Where any man stands in danger of harm from another, and makes oath thereof before a justice of the peace, he must be secured by good bond, which is called *binding to the peace*. Any justice of the peace may, *ex officio*, bind all those to keep the peace, who, in his presence, make any affray; or threaten to kill or beat another; or contend together with hot and angry words; or go about with unusual weapons or attendance, to the terror of the people; and all such as he knows to be common barretors; and such as are brought before him by the constable for a breach of the peace in his presence, and all such persons, as, having been before bound to the peace, have broken it and forfeited their recognizances. (1 Hawk. P.C. 136.) Also, wherever any private man hath just cause to fear that another will burn his house, or do him a corporal injury, by killing, imprisoning, or beating him; or that he will procure others so to do; he may demand surety of the peace against such person; and every justice of the peace is bound to grant it, if he who demands it will make oath, that he is actually under fear of death or bodily harm; and will shew that he has just cause to be so, by reason of the other's menaces, attempts, or having lain in wait for him; and will also farther swear that he does not require such surety out of malice or mere vexation. (Ibid. 127.) This is called *swearing the peace* against another; and if the party does not find such sureties, as the justice in his discretion shall require, he may immediately be committed till he does. (Ibid. 128.) A recognizance for keeping the peace, when given, may be forfeited by any actual violence, or even an assault, or menace, to the person of him who demanded it, if it be a special recognizance; or, if the recognizance be general, by any unlawful action whatsoever, that either is or tends to a breach of the peace. Blackst. Com. b. iv. See *GOOD-BEARING*.

PEACE, Time of, is when the courts of justice are open, and the judges and ministers of the same may by law protect men from wrong and violence, and distribute justice to all. See *Coke on Litt.*

PEACE of the King, pax regis, mentioned in the stat. 6 Ric. II. &c. is that security which the king promises his subjects, and others taken into his protection, both for life and goods.

PEACE of God and the Church, pax Dei & ecclesie, mentioned in our *Ancient Law Books*, is that rest and cessation which the king's subjects had from trouble and suit of law, between the terms.

PEACE of the Plough, that whereby the plough, plough-tackle, and plough-cattle, are secured from distresses.

Thus fairs may be said to have their peace, because no
XXVI.

man may be troubled in them for any debt contracted elsewhere.

PEACE, Clerk of the. See *CLERK of the Peace*.

PEACE, Commission and Justice of. See *JUSTICES of Peace*.

PEACE, Conservator of the. See *CONSERVATOR*.

PEACE, Homage of the. See *HOMAGE*.

PEACE, in *Mythology*, a goddess among the Romans, to whom they erected a variety of magnificent temples. The temple, which was begun by Claudius, and finished by Vespasian, was not inferior to any in Rome. If we may believe Suetonius, Josephus, and St. Jerom, the emperor deposited there the precious and rich spoil of the temple of Jerusalem. In this temple those who professed the fine arts assembled, in order to dispute about their prerogatives, that in the presence of the goddess of peace, all heats might be banished from their debates. This goddess had also in the same city an altar, which was very much frequented. Monuments represent to us peace under the figure of a woman crowned with laurel, olive, or chaplets of roses, holding in one hand the caduceus, and in the other ears of corn, the symbol of plenty, which she procures. Aristophanes gives her Venus and the Graces for her companions. See *CONCORD* and *TRANQUILLITY*.

PEACE, in *Geography*, an island on the coast of Nova Scotia, S. of Mirachi point.

PEACE River, a large river of North America, which runs north-easterly into the Lake of the Hills. In the driest season, it is a quarter of a mile wide. The lands on this river are inhabited by the Beaver and Rocky Mountain Indians, who are an uninformed and barbarous race of beings. Polygamy is practised among them, and the women are in the lowest state of debasement. At their funerals, among other extravagant tokens of sorrow, the women, if the deceased be a favourite son or husband, cut off a finger at the first joint. Some of the old women have not a whole finger left. The men think it below their dignity to shew any mark of grief. These persons are great gamesters, and pursue this as their employment for several days and nights. Their habitations are formed by setting up a number of poles, united at the top, and expanded at the bottom in a circle of 12 or 15 feet diameter. These are covered with dressed skins sewed together. This business, and other drudgeries, are performed by the women, while the men sit smoking at their ease.

PEACEE, a town of Hindoostan, in Oude; 40 miles S. of Goorackpour.

PEACH-TREE, in *Botany and Gardening*. See *AMYGDALUS*.

PEACH-Tree, in the *Materia Medica*. The fruit of the peach is known to be grateful and wholesome, seldom disagreeing with the stomach, unless this organ is not in a healthy state, or the fruit has been eaten to excess. The flowers, including the calyx as well as the corolla, are the parts of the perica used for medicinal purposes. These have an agreeable but weak smell, and a bitterish taste. They are used as a purge for children made into a syrup, and are by some recommended as great destroyers of worms; but there is a circumstance attending them which is little taken notice of, and yet greatly alters their virtue. The custom of gardeners is, to graft the peach upon the almond or the plum-tree, and the flowers partake of the nature of the stock; those which are produced on peach-trees grafted on plum-stocks being much more purgative than those from almonds; the reason of which seems plainly, that the plum is a purgative fruit, the almond not at all so. The flowers of the least esteemed sorts of peaches are also usually found to be the best for medicinal use.

In examining these flowers, they are found to contain more than three-fourths of a superfluous humidity. The buds contain a little less than the blown flowers; which is very natural to be supposed, because it is their being afterwards charged with a larger portion of humidity which makes them open. The buttons, or buds of the flowers, are found on experiment, however, to be somewhat more purgative than the flowers when open.

If four pounds of these flowers are distilled in a balneum Mariæ, they yield twelve or thirteen ounces of a whitish liquor, sweet to the taste, and of an agreeable smell, resembling that of bruised peach kernels; and this is so strong in the water, that a few drops of it will very agreeably scent a larger quantity of any thing. If the buds are used to this purpose, instead of the open flowers, the same sort of liquor is drawn over; but it is of a somewhat coarser and more earthy smell. The residuum of these distillations put into a retort, and distilled by a reverberatory fire, gradually raised to its several degrees, yields both acid and alkaline substances; and, finally, a red spirit comes over, full of fuliginous particles, and containing some oil, part of which swims at the top of the liquor, and the other part, which is heavier, sinks to the bottom. This is what a chemical analysis shews in these flowers, different from other vegetable matters. Spirits of wine draw a very weak tincture from these flowers; it is indeed much weaker than an infusion of them in common water. An infusion in water of half an ounce of fresh peach-flowers, or of a dram of dry ones, (for, as before observed, they contain three-fourths of superfluous moisture) is a very gentle and agreeable purge, and it is said, when sweetened with sugar, to prove an useful purgative and anthelmintic for children.

This method of infusion is much better for these and all other purgative flowers, than the taking of the expressed juice; for in that case there is always a large quantity of purgative matter remaining in the residuum; which water in a warm infusion is able to take out. The infusion of rose or peach-flowers keeps also better than their expressed juice.

The juice always turns sour very soon; but the infusion, with the common caution of pouring a little oil on the surface, will keep good even for years.

When oil is used for this purpose, there should always be care taken that it be such as does not freeze easily; for in that case, the air gets in between the cake of frozen oil and the sides of the vessel, and spoils the liquor. Oil of almonds is greatly to be preferred to oil of olives on these occasions; as it freezes with much more difficulty. Another way of preserving the infusions is, the evaporating about half the liquor; and thus they will often keep a long time: as infusions keep better than the juices of plants, this seems to shew, that the former contain more of the principles than the latter.

The young leaves of the peach, made into an infusion in the same manner as the flowers, are more purgative than they, but less agreeable: they are to be taken in the same manner. Mem. Acad. Par. 1714.

These leaves are found to possess an anthelmintic power, and, from a great number of experiments, appear to have been given with invariable success to children and adults. However, as the leaves and flowers of the persea manifest in some degree the quality of those of the lauro-cerasus, they ought to be used with caution.

PEACH-Colour, the pale red colour of the blossoms of the peach-tree.

To give this beautiful colour to glass, add at different times, and in small quantities, the powder of prepared manganese to the mass for the making of lattimo, or milk-white

glass, while in fusion. This alone gives the peach-colour; but the metal must be immediately worked when of a right tinge, for the colour is very apt to go off.

PEACH-Colour, in the *Manège*. See BLOSSOM.

PEACH Gall-Insect, in *Natural History*, a small gall-insect, found in great plenty on the peach-tree. It is of an oblong figure, flat at the belly, and prominent on the back; pointed, and not unaptly resembling in miniature a small boat turned bottom upwards: their longer diameter is usually extended in the same direction with the length of the branch; sometimes a little obliquely, but scarcely ever perpendicular to that direction.

Their colour is usually a faint brown, sometimes it approaches to a coffee-colour, sometimes to a bright chestnut, but more frequently it has something reddish in it. This insect lives but a little while after it has laid its eggs, and its dried body makes an excellent covering and defence for them; and what is very remarkable is, that as this insect is now immoveable, and cannot draw itself over its eggs, they are not thrown out behind its body, as the eggs of other animals; but as they are laid, are drawn under the belly, and evenly arranged there.

The eggs are ten or twelve days before they hatch, and when hatched, the young animals remain quiet under the cover of their mother's carcase for several days.

It is usually about the beginning of June that the young insects get at liberty from under the body of their parent; they may then be found running very nimbly all over the branches of the tree, but are not distinguishable otherwise than by examining the branches with a microscope. The branches, thus covered with these young animals, are in a few days cleared again, and the insects found in form of small scales, covering the leaves, and now large enough to be seen by the naked eye.

Not only the gall-insects of the peach, but all the other species, after a certain time, become immoveably fixed to the place where they are, and no longer able to use their legs. Their growth is very slow from the time of their hatching, through the months of July, August, September, and October: at the beginning of November they are found somewhat enlarged in breadth, but they are yet no thicker, and at this time they are all become of the same colour, which is somewhat reddish. In the beginning of March they begin to swell and be filled with the growing eggs; their backs become a little convex, and, viewed with a microscope, appear covered with little tubercles; and one may, at this time, perceive seven or eight long threads, which run from several parts of their bodies: these fasten themselves to the branch at a distance from the creature, and fix it immoveably in its place. In the beginning of April they become much more convex, and though they can no longer walk about, they yet have at this time sufficient motion to shew an animal life. At this time, by very slow motions, they change their skin; and it is after this change that they assume so exactly the figure of galls, and grow so very quickly to their full size. Seven or eight days now make such a change in them, that they are not to be known for the same animal; but it is not till the beginning of May that they arrive at their utmost size. About the 15th of May they are in a condition to lay, and as the eggs are discharged, the belly is pushed closer and closer to the back; and when all are laid, becomes the shell before described, and the young ones are hatched under it, and become full of eggs, and do the same office afterwards to their young.

In the end of April the branches of the peach and other trees, covered with these insects, will be found to be greatly frequented by a sort of small flies, beautiful enough to demand

mand attention; their head, breast, body, and legs, are all of a deep red; they have only two wings, but those very large, being nearly twice as long as their bodies: these, in the fly's common posture, are crossed on the back, and the upper almost entirely hides the under one; they are less transparent than those of the common flies, and are of a dusky white, bordered with an edge of a fine bright and beautiful red: but what chiefly distinguishes them from all other species is, that they have two long white threads which run from their hinder part, and are of twice the length of their wings; between these there is also a remarkable part, a sort of tail made like a piercer, and of a third or fourth part of the length of these threads. This is, like all other stings, thicker at its base than at its point, and is bent a little downwards. The antennæ of this fly are adorned with long bodies, hairy, and larger at their extremities than at their insertions on the antennæ. It is easy at first sight to conceive, that these are the flies that had been produced of worms fed in the bodies of the gall-insects of a former year, and that they were now searching an opportunity to deposit their eggs in the bodies of these little creatures, to be hatched into worms there, and thence to come out in flies, as they themselves before had done.

The flies examined on the branches with a glass will also be found to introduce this seeming piercer always at the same place into the body of the gall-insect, and this is that cleft in the hinder part of the body, out of which the young ones, when hatched, afterwards find their way. The flies, which lodge their eggs or young worms in the bodies of other insects, if crushed at that season, will be always found to contain such eggs or small worms; and the microscope never fails to discover them in the matter crushed out of flies even smaller than these, but in these no observation ever shews any such. See *GALL-Insect-Fly*.

Notwithstanding that the peach gall-insect is the only species in which the male fly has been observed, there is no room to doubt but that the other species all have males of the same kind.

The orange gall-insect has been observed not universally fecundated, but that there is only a part of the animals that lays eggs; probably the others are those which hatch into the male flies; and the kermes, the noblest and most valuable of all the gall-insects, is known often to produce a white winged fly, very like that of the peach gall-insect. And Brennius, who gave some time since a history of the scarlet grain of Poland, the *coccus Polonicus*, a kind of pro-gall-insect; though in the first account, he gave into the opinion of both sexes being included in each of these animals, and that each was in itself sufficient for the propagation of its species: yet afterwards, to his very great honour, added an account of his having discovered the male of this species, which he describes to be a small fly, with a red body and white wings bordered with red; a fly in all respects like the male of the peach gall-insect. Reaumur's Hist. Inf. tom. iv. p. 1, to 44.

PEACH of the Cornish Miners, in *Mineralogy*. See *CHLORITE*. N. B. Under that article, read *peach* for *pearls*.

PEACH Water. See *WATER*.

PEACH, Wolf's. See *LYCOPERSICON*.

PEACH Island, in *Geography*, an island of Upper Canada, in lake St. Clair, about seven miles higher up than Detroit, nearly opposite to the communication of the Grand Marais with that lake. It contains from 60 to 100 acres of land fit for tillage; the other parts being meadow and marsh. There is little wood in this island; nor is it improved.

PEACHAM, HENRY, in *Biography*, author of a book, entitled "The complete Gentleman," published in the reign

of James I. It treats of "nobilitie in generall; of dignitie and necessitie of learning in princes and nobilitie; the time of learning; the dutie of parents in their children's education; of a gentleman's carriage in the univeritie; of stile in speaking, writing, and reading history; of cosmography; of memorable observation in the survey of the earth; of geometry; of poetry; of musicke; of statues and medalls; of drawing and painting in cyle; of sundry blazonnes both ancient and modern; of armory or blazing armes; of exercise of body; of reputation and carriage; of travaile; of warre; of fishing."

He was certainly a man of general knowledge, good taste, and acute observation. He resided a considerable time in Italy, where he learnt music of Orazio Vecchi. He was intimate with all the great masters of the time at home; has characterized their several styles, as well as those of many on the continent. His opinions concerning their works are very accurate, and manifest great knowledge of all that was understood at the time respecting practical music. He seems to have been a travelling tutor, for which office he appears to have been particularly well qualified. But with all his accomplishments, he is said to have been reduced to poverty in his old age, and chiefly to have subsisted by writing little penny books, which are the common amusement of children.

PEACIAM, in *Geography*, a post-town of America, in Caledonia county, Vermont, west of Barnet, on Connecticut river; containing 873 inhabitants.

PEACOCK, in *Astronomy*. See *PAVO*.

PEACOCK, REGINALD, in *Biography*, a worthy prelate, was successively bishop of St. Asaph and Chichester, by favour of Humphrey, the good duke of Gloucester; but he was deposed for resisting the papal authority, and denying the doctrine of transubstantiation, with other articles of the Roman Catholic faith. He was not equal to suffering in a righteous cause, but recanted his notions, and his books were publicly burnt. He then retired to an abbey, probably mortified and ashamed of his timidity, where he died about the year 1486.

PEACOCK, in *Ornithology*. See *PAVO*.

Peacocks were first brought from India, where they are still found, in the wild state, in vast flocks, in the islands of Ceylon and Java. From India they were removed to Greece, and being the birds sacred to Juno, were preserved about the temple of this deity at Samos: it is therefore probable, that they were brought here originally for the purposes of superstition, and afterwards cultivated for the uses of luxury. The peacock frequently accompanies the statues of Juno, and it was from her superior love to it, that she placed in its tail the eyes of Argus, after Mercury had put him to death.

Peacock's crests were anciently worn among the ornaments of the kings of England.

PEACOCK'S Tail. See *TAIL*.

PEACOCK-FISH, in *Ichthyology*, one of the larger species of the *turdus*, or *wrasse*, but of a middle nature between the long and the flat-bodied kinds; its usual standard, as to size, is about three pounds weight; and its colour on the back a mixture of blackish and a dusky blue; the blue is disposed in three or four longitudinal parallel lines, on a dusky blackish ground; about the head and gills the blue lines are more bright and numerous; its lower jaw is almost wholly blue, and its belly is of a fine saffron colour or reddish yellow; it has thick lips, and very sharp, though not very large teeth; its back-fin is, on the anterior part, of a fine deep blue, with an edge of purple, and sometimes of yellow; and the rest of the fin is red at the bottom and yellow at the top, and in

the middle is finely variegated with blue spots; the foremost nerves of the back-fin are rigid and prickly, and have soft and flexile rays accompanying them beyond the limb or edge of the fin, and of more than their own length; its gill-fins are a mixed red and yellow, and its belly-fin behind the anus of a pale flesh-colour, with a variegation of blue and yellow; the other belly-fins are of the same colour, and the tail is wholly blue. It is a most remarkably beautiful fish, and from the spots and variegations of its fins has obtained its name. See CHÆTODON and LABRUS.

PEAK, or PEEK, in *Sail-making*, the upper corner of triangular sails, and upper outer corner of fore and aft sails.

PEAK, in *Geography*, a mountain of England, giving name to a district in the county of Derby, between the Derwent and the Dove, which last river separates it from Staffordshire. It is mountainous, rocky, and barren, but abounds in mines of lead, iron, coal, and antimony: it also furnishes mill-stones and grind-stones.

PEAK *d'Etoile*. See *NEW HEBRIDES*.

PEAKS of *Ottor*, the highest part of the Blue Ridge, in the west part of Virginia, or perhaps any other in North America. From its base its height is about 4000 feet.

PEAKE BAY, a bay on the fourth coast of Jamaica. N. lat. $17^{\circ} 59'$. W. long. $76^{\circ} 38'$.

PEAN, in *Heraldry*, is when the field of a coat of arms is fable, and the powderings or.

PEANJEE, in *Geography*, a town of Pegu, on the Irrawaddy; 15 miles S. of Prone.

PEANTIDES, the name of a stone to which the ancients attributed great virtues for promoting delivery.

These stones were found in Macedonia and other places; and all the description we have of them is, that they resembled water congealed by frost. Probably the ancients meant by this name the *stalactites*, or stony icicles, which, as they hang from the roofs of caverns, greatly resemble the droppings of water from the eaves of houses congealed in frosty weather.

PEAR, in *Orcharding*, a fine rich sort of fruit, which is obtained from an orchard-tree of the same name, and from the juice of which the liquor called perry is prepared. See PEAR-Tree, below.

PEAR-Tree, in *Botany and Gardening*. See PYRUS.

PEAR-Trees, a fruit tree of the orchard kind. There are many sorts of this tree; but for the purpose of perry, the squash is in much the highest esteem. It is an early fruit, remarkable for the tenderness of its flesh. If it drops ripe from the tree, it bursts to pieces with the fall. The liquor made from this fruit is pale, sweet, yet remarkably fine, and of a strong body; a most excellent liquor, if duly manufactured from a soil which suits it. The oldfield is a favourite old pear, remarkable for the elegant flavour of its liquor. The barland pear is in great repute, as producing a perry which is esteemed singularly beneficial in nephritic complaints; as is the red pear for producing liquor of singular strength. The huffcap and the sack are other pears which have been usually grafted: and besides these, and a variety of others, great numbers of kernel fruits are found among the pear-trees in Herefordshire and other countries. See ORCHARD and PERRY.

Sorts.—Mr. Knight states, in his valuable Treatise on the Culture of the Apple and Pear, that “the experiments he has made on the pear have not been nearly so numerous as those on the apple, and have been confined to a single variety, the Teinton squash; but they have been fully sufficient to convince him, that the diseases of both chiefly arise from the debility of old age, and will be found equally incurable.

Though the pear is more properly a naturalized than an indigenous fruit in this country, it is much more hardy than the apple, and may certainly be cultivated in almost every part of England with nearly as much success as in Herefordshire. Like the apple it grows with the greatest luxuriance in strong deep soils, and in these the finest liquors are at present obtained from it; but it will flourish in every variety, where it is not incommoded with water. Its culture differs so little from that of the apple, that the same rules are in general equally applicable to both. It is most successfully propagated on stocks of its own species, but it will succeed in some degree on those of the quince, the medlar, the whitebeam, the common service, and the hawthorn; and probably on many others. When grafted on its own feeding stocks, which alone he would recommend, the operation should always be performed near the ground, on account of the reclining top-heavy growth of the young stocks. In raising stocks from the seeds of this fruit, a light, soft, loamy soil should be chosen, which is naturally of good quality, but which has not been recently manured. In this the seeds, like those of the crab-tree, should be covered about an inch deep, as soon as they are taken from the fruit.” And “much attention must be paid to them during the early part of the first summer, or great numbers will perish. They must be kept clear from weeds, and be regularly watered in dry weather; and if the mould be frequently stirred between the plants, it will be of great advantage to them: after the middle of August, they become more hardy, and little care or attention will be required from the planter.

“A sufficient number of varieties of this fruit, in a good state of growth, are in cultivation; but few of them possess any high degree of merit. The greater part are extremely productive of juice, and require to be ground soon after they fall, or are blown from the trees. The produce of some of them, when it has been nicely manufactured from well ripened fruit, often possesses great excellence; but it is often at the same time sweet and acetous; and if, owing to an unfavourable season, the fruit has not been properly ripened, and an access of fermentation cannot be prevented, the liquor becomes sour and unpalatable, and scarcely good enough to answer the meanest purposes of the farm-house.” He is “much disposed to doubt whether a single perry-pear, possessing nearly the greatest degree of excellence of which this fruit is capable, has yet been in cultivation. It appears highly probable that firmer fruits, which might be kept some time, or left under the trees to attain a more perfect and regular maturity, are likely to afford a more permanent and generous liquor. One pear, which in some degree answers this description, has been much cultivated, the longland; and though its produce, being without the fine flavour which is found in some others, is little attended to by the merchant, it has qualities which render it extremely valuable to the farmer: the fruit may be kept some time without sustaining any great degree of injury, when business of more importance occupies his attention: the liquor obtained from it is never very fine, but it is rarely below mediocrity: it possesses more body than is generally found in perry, and retains many of its good qualities in every different soil and situation. It is a fruit he should strongly recommend for culture in cold and exposed situations, for which the hardness of its blossom renders it peculiarly well calculated; but he is afraid it is advancing nearly to that period when young trees can no longer be raised with advantage to the planter.”

It is noticed, that “the pear is an extremely long-lived tree, and the same variety may in consequence be very long kept

PEAR-TREE.

kept in cultivation. At what period the Teinton Squash first sprang from the seed, probably cannot now be ascertained; but he suspects from its present diseased and worn out state, that it existed at least as early as the beginning of the sixteenth century. For another kind, the barland, which was much cultivated in the early part of the seventeenth century, still retains a large share of health and vigour, and the identical trees which supplied the inhabitants of Herefordshire in the seventeenth century with liquor, are likely to do the same good office to those of the nineteenth. He suspects, however, that this variety naturally possessed a greater degree of durability than is common to the species; and that its lofty spiral growth, by rendering it difficult to get grafts from the extremities of the bearing branches, has, in cultivation, made it still more durable. It is yet capable of being propagated; but trees nearly of the same stature with those which now abound, must not again be expected. The tree, which is said to have been the original, grew, he says, in a field called the Barlands, in the parish of Bosbury, and was blown down a few years ago."

"But though he does not think very highly of any of the perry-pears which are now cultivated, he does not know that he can point out the means of acquiring better. Those which he has employed to obtain improved kinds of apple, appear to him to be wholly improper. Every variety of that fruit, which possesses colour and richness, is capable of making fine cider, but a good perry-pear requires an assemblage of qualities, which will be rarely found in the same fruit. It must contain a large proportion of sugar, or its juice can never possess sufficient strength; and unless it be at the same time extremely astringent, the liquor produced from it will be acetous whenever it ceases to be saccharine. In the latter state it will agree with few constitutions, in the former with none. The juice of the best perry-pears is so harsh and rough, as to occasion a long continued heat and irritation in the throat, when the fruit is attempted to be eaten; yet by being simply pressed from the pulp, it becomes rich and sweet, without more roughness than is agreeable to almost every palate. This circumstance appears extraordinary, but it does not stand alone in the vegetable world." There are many cases in which similar changes take place with acrid vegetable substances. It is stated that "the defects of the apple and pear, when raised from seed, are generally of opposite kinds: in the former the fruit is usually harsh and sour, in the latter it is apt to be, when thoroughly ripe, sweet and insipid. The mode of cultivation therefore, which would improve the one by bringing it nearer to the highly cultivated state, and lessening its harshness, would not improbably be injurious to the other by producing the same effects."

It is stated that "an estimate may be formed in the apple of the merit of the fruit by the leaf and growth of the seedling tree, but in the pear these scarcely afford the slightest indication of the future produce. The leaves of those plants which will afterwards afford large rich fruits for the desert are often small and thin, and the stems will be covered with thorns; whilst others, whose leaves and growth shew every mark of a high state of cultivation, will sometimes produce fruits that are small and worthless."

It is not known that "better means can be used in obtaining new varieties of this fruit, than sowing a large quantity of seeds from healthy trees of an orchard in which the best kinds only have been planted, and afterwards selecting the plants of the most luxuriant and vigorous growth. But as no estimate can be formed of the value of their future produce, it will be prudent to retain a considerable number

till their fruits be known: few of which, he is afraid, must be expected to answer the wishes of the planter.

"He has, during the last twelve years, examined a very large number of seedling pears, and has a considerable variety growing on a farm he occupies, but he has never discovered more than one kind which he thought capable of making fine perry. The greater part of these, however, appeared to him to have sprung from the seeds of rich eatable pears, and some of them bore a very close resemblance to the fruits of old grafted trees in the neighbouring orchards. There is little reason to believe that the resemblance would have been less between the parent and the seedling fruit, had the former been eminent for the production of fine perry; and it therefore appears probable, that good new kinds may readily be obtained from the seeds of the best now cultivated. But even if few should be found capable of affording fine perry, the produce of all will be valuable to the farmer to mix with crabs, or apples which have been blown prematurely from the tree. The rapid sweetness of the juice of the pear is corrected by the acidity of these, and the liquor produced by the mixture often produces much more merit, than could have been expected from the ingredients. It will perfectly supply the place of small beer, and may be brought into the market at less than half the price, with sufficient profit to the grower."

And it is said that "the time which seedling trees will require to attain sufficient maturity to produce fruit, appears to vary much in different varieties. He has one plant which produced fruit at sixteen years old, and another which, from the concurrent testimony of many old people, who remember its first blossoms, appears to have remained unproductive through the first seventy years of its existence. It has since borne tolerably well; but its fruit is always without seeds, or internal cavity; and it appears to set with difficulty, much the greater part of the blossoms being constantly unproductive. Possibly its long continued barrenness, and the defects in its fructification, may both have arisen from some incidental imperfection in the organization of the plant. The fruit is in other respects perfect, and possesses great merit as a pear for the table."

It is stated that the directions he has given for planting the apple, are in every respect applicable to the pear; except that this tree being of more luxuriant and lofty growth, will require wider intervals. See *APPLE-TREE* and *ORCHARD*.

Planting.—In the most closely planted orchards the rows should not "be put at less than eighteen yards distance, nor the trees nearer than eight or nine to each other; and when the ground is to remain in tillage, intervals of twenty-five, or thirty yards, should be allowed between the rows. Attention must also be paid to the forms and stature of the different varieties, and as the fruit of these is rarely mixed with a view to make fine perry, trees of one kind should occupy each row." And that as "in some kinds the fruit grows only on the outside of those branches which are exposed to the sun and air; while in others it occupies every part of the tree; the former will of course require to be planted at greater distances than the latter."

Farther, "as the produce of the pear-tree, though of the same variety, and growing on the same stock, ripens extremely irregularly; the planter must therefore have a considerable number of trees of each kind he plants, or he will rarely have a sufficient quantity ready to be ground at the same time. Even when the fruit has fallen spontaneously from the trees, a fourth at least of some kinds will be found immature, or decaying, and totally unfit to make fine perry;

and

and should be (though it rarely or never is) separated from the rest." It is to this want of perfect and regular maturity in the fruit that Mr. Knight ascribes a defect, which perry is seldom found wholly free from, which is that of a crude and harsh acid which dwells on the palate, and which disgusts the best judges of vinous liquors; and to the same cause it may be owing, that perry, when genuine, does not agree with so many constitutions as cider. It is noticed that "the pear requires a certain state of maturity to afford perry in the greatest state of perfection: it should be ripe without being mellow, or decaying; when it has not obtained the proper state of ripeness, an excess of fermentation cannot be prevented, and when it has exceeded it, the liquor rarely ferments kindly, and is extremely apt to become sour; probably by having lost too great a proportion of its astringency; hence few kinds are found to improve by being kept after they have fallen from the trees."

Pruning.—"This is not often wanted in the culture of the pear-tree, which is rarely much incumbered with superfluous branches; but in some kinds, whose form of growth resembles the apple-tree, it will sometimes be found beneficial. The directions in this case are the same as those for the apple. See APPLE and ORCHARD.

Pear-trees are subject to similar diseases with those of the apple; "the blights of the trees, like those of the apple, arise either from insects or unfavourable weather, or a combination of both. The blossoms are often rendered abortive, by a small brown beetle, precisely similar to that found on the apple-tree, and probably of the same species; and a considerable quantity of its fruit is frequently destroyed by the *larvæ* of a small green four-winged fly. Each fruit which contains the latter insects becomes in a few days rounder than those in the natural state; and grows with much greater rapidity; but it falls off early in the summer, and if it be examined whilst growing, it will be found full of small grubs." But "the pear-tree suffers more frequently from cold than from insects, and therefore those varieties whose blossoms are produced rather late in the spring, and are preceded by the leaves, are generally most productive of fruit; and some kinds of the pear, as of the apple, are much more subject to injury, both from insects and unfavourable weather, than others. He has one seedling tree whose blossoms appear capable of bearing the most unfavourable weather without injury, and which has not once failed to produce a good crop in the memory of the oldest inhabitant of the village in which it stands. The fruit is rather too sweet to make good perry, unless in mixture with other kinds; but it nevertheless forms a very valuable variety for cold and exposed situations, as it ripens somewhat early in the autumnal season of the year." In the Report of the State of Agriculture in Herefordshire, it is stated that the pear, though in common producing an inferior liquor, has many advantages over the apple for general use. It is capable of succeeding in a greater variety of soil, is more productive of fruit, and less liable, especially in the perry kinds, to depredations. Besides, it has a more ornamental effect, and is of course better calculated for particular situations. The produce of each full-grown tree, will mostly be in the proportion of about twenty gallons of liquor. See APPLE-Tree.

The particular methods of preparing pears in the manufacture of perry, will be considered hereafter under the proper head. See PERRY.

PEAR, *Avocado*, or *Alligator*, a species of *Laurus*; which see.

PEAR, *Bachelor's*, a species of the *Solanum*; which see.

PEAR, *Garlic*. See CRATEVA.

PEAR, *Prickly*, or *Indian Fig*, *Opuntia*. This, in the Linnæan system, is a species of *Cactus*; which see.

PEARCE, ZACHARY, in *Biography*, a learned prelate of the church of England, was born at London in the year 1690. The earlier part of his education he received in a private school at Great Ealing, whence, in 1704, he was removed to Westminster school, then under the management of Dr. Busby. Here he remained six years, and greatly distinguishing himself, he was elected one of the king's scholars. In 1710 he went to Trinity college, Cambridge. He pursued his academic studies with great diligence and success, and obtained a high reputation as a classical scholar. During the first years of his residence at Cambridge, he occasionally amused himself with the lighter species of composition, some of which he sent to the *Guardian* and *Spectator*. In 1716 he published, from the university press, an edition of "*Cicero de Oratore*," with notes and emendations; which, at the desire of a friend, he dedicated to lord chief justice Parker, a circumstance which laid the foundation of his future fortunes. He was first elected a fellow of Trinity college, and waiting on lord Parker, to thank him for his interest on that occasion, his lordship presented him with a purse containing fifty guineas. In the year 1717, Mr. Pearce entered into deacon's orders; and in the following year he was ordained priest. It had always been his wish to devote himself to the clerical profession; but as he himself has told us, he delayed to do so till he had attained his twenty-seventh year, in order that he might, by a due degree of preparation, attain to so much knowledge of that sacred office, as should be sufficient to answer all the good purposes for which it was designed. In 1718, lord Parker having been appointed lord chancellor, Mr. Pearce was invited to live with him in the capacity of domestic chaplain; which invitation he gratefully accepted. In 1719 he was presented to the rectory of Stapleford-Abbots, in Essex, to which preferment the lord chancellor added, in the following year, that of St. Bartholomew, behind the Royal Exchange, in London. Soon after this, Mr. Pearce had the honour of being appointed chaplain to his majesty. In the year 1721 he married a lady possessed of a considerable fortune, by whom he had several children, all of whom died very young. About a year after his marriage, he was presented with the vicarage of St. Martin's, and in this prominent situation it was thought right he should take his doctor's degree; but as he was not of sufficient standing at the university, application was made for him to Dr. Wake, archbishop of Canterbury, who granted him that title by his diploma. In 1724 Dr. Pearce dedicated to his patron, now the earl of Macclesfield, his edition of Longinus on the Sublime, with a new Latin version and notes; which, by the masterly manner of its execution, contributed greatly to the increase of his reputation as a scholar and critic. To the ruin of the earl of Macclesfield, which happened in 1725, it was in some measure owing that several years elapsed, from this period, before our author received any additional preferment; and for the next he was indebted to the patronage of queen Caroline, though he did not obtain it till after her decease. In the year 1739 he was nominated dean of Winchester by sir Robert Walpole, to whose favour he had been recommended by the late queen. In 1744 the dean was elected prolocutor of the lower house of convocation for the province of Canterbury; and in 1748 he was promoted to the bishopric of Bangor. It is generally believed that he was really averse from accepting the episcopal dignity, and he was still more reluctant to comply with the solicitations of his friends, by being promoted to the bishopric

bishopric of Rochester, together with the deanery of Westminster. Twice after this he might have been raised to the high dignity of the bishopric of London, but he declined the honour. In a short time after the second offer, being at the advanced age of seventy-three, and thinking himself unable properly to discharge the duties of his station, he informed his friend, lord Bath, of his determination to resign both his bishopric and deanery, and to retire from the active duties of life; at the same time soliciting his lordship to request for him the honour of a private audience from his majesty for that purpose. This favour was granted to him, and the king, after having taken some time to deliberate, and to consult his legal advisers on the subject, signified his consent, and the bishop actually kissed hands on the occasion. A dispute, however, occurred between lord Bath and his majesty's ministers with respect to a successor, which in a manner obliged the king to send again for Dr. Pearce, and tell him he must think no more about resigning his bishopric. In 1768 he did, however, obtain the king's consent to his resigning the deanery of Westminster, and from that time he discharged his episcopal functions, and pursued his private studies, with all his remaining vigour till the year 1773, when he was seized with paralytic affections, that continued to increase till his death, which took place in June 1774, when he had attained to the 84th year of his age. Having no children, and having lost his wife the year before his own death, he made his brother, William Pearce, esq. his heir and executor. He bequeathed his library to the dean and chapter of Westminster, excepting such books as they already had, and these, with his MSS., he gave to his chaplain the reverend John Derby. He left by his will several legacies to private persons, and to public charities; but his principal legacy was to a college at Bromley, in Kent, which had been founded by bishop Warner in 1666, for twenty widows of clergymen who stood in need of assistance. "The fabric is neat, the apartments are commodious, and the condition of the inhabitants such as infers no degradation of civil rank. The revenue assigned by the founder was, in his time, not only competent but liberal; yet, by the alterations which the last century has produced in the modes of life, and the system of expence, what was then ample is now become scanty, and bishop Pearce left 5000*l.*, not to increase the number, but to advance the happiness of the society, by such an augmentation of revenue as might rescue them from penury. In this charity there is no ostentation; his benefaction scarcely continues his name, but sinks silently into the ancient fund, and those who shall enjoy the plenty which it restores, will, in a few years, hardly know to whom they owe it."

Dr. Pearce was first known to the public by philological learning, which he continued to cultivate with advanced age. "Cicero de Oratore" was published by him when he was bachelor of arts, and "Cicero de Officiis" when he was dean of Winchester. He did not confine his attention to the learned languages: he was particularly studious of Milton's poetry; and when Dr. Bentley published his imaginary emendations of the "Paradise Lost," Dr. Pearce wrote a vindication of the established text. In domestic life he was quiet and placid, not at all difficult to be pleased, nor inclined to harass his attendants or inferiors by peevishness or caprice. In his parochial cure he was punctually diligent, and very seldom omitted to preach. He was author of several works besides those already mentioned: among these were "The Miracles of Jesus vindicated;" and "Two Letters to Dr. Waterland upon the Eucharist;" but his great work was not published till 1777, under the title of "A Commentary, with Notes, on the

Four Evangelists, and the Acts of the Apostles, together with a new Translation of St. Paul's first Epistle to the Corinthians, with a Paraphrase and Notes," in 2 vols. 4to. This work is unquestionably the result of many years' studious application, and it reflects lasting honour upon his learning, critical talents, and intimate knowledge of the sense and spirit of the sacred writings. It now ranks high among theological students; but either from the largeness of the number printed, or from some other cause, unknown to the writer of this article, the commentary was for many years almost a drag on the booksellers' shelves. The copy from whence the foregoing particulars have been chiefly extracted was purchased as low as twelve shillings. Its value at present is better appreciated. Mr. Derby, his lordship's chaplain, gave likewise to the public four volumes of his lordship's sermons, on subjects of high importance to the present and future welfare of mankind. Bishop Pearce was author of N 121 of the Guardian; and of 572 in vol. viii. of the Spectator, and also of N 633 in the same volume, "On the Eloquence of the Pulpit."

PEARCH, or PERCH, in *Ichthyology*. See PERCA.

PEARL, PERLA, or *Margarita*, in *Natural History*, a hard, white, smooth, shining body, usually roundish, found in a testaceous fish, of the oyster kind; and is ranked in the number of gems.

The fish in which the pearls are found, is three or four times the size of the common oysters; and is called by naturalists, the "concha margaritifera." The East India pearl-shell is the "matrix perlarum" (mother of pearl) of Rumphius, or the "mytilus margaritiferus" of Linnæus; and therefore the general term pearl-oyster must be erroneous. Some also are found in a species of mya, or muscle. That pearls are not peculiar to one kind of shell-fish, as many have believed, was known to Pliny, who says, "quo apparet, non uno conchæ genere nasci." Many very good pearls have been found in Colchester oysters: and real pearls are found under the shell of the sea-hare (*aplysia*).

This fish is common in the gulf of Persia, near Ormus and Bahrein island; about cape Comorin, on the coast of the island of Ceylon; in the Bornean islands; in Saxony, and in Scotland, and also in South America.

The ancients called these pearls *uniones*, apprehending that there never was but one in an oyster; but there have been sometimes found seven in a shell; and an author, who treats well of their production, pretends to have seen a hundred and fifty in the same fish, but those in different degrees of perfection. The most perfect drop out first; the rest remaining longer at the bottom of the shell.

An ingenious writer (Henry J. Le Beck, esq.) has, in the 5th volume of the Asiatic Researches, given a particular account of the pearl-fishery at Ceylon, and also of the animal inclosed in the *mytilus margaritiferus*, from which the pearl is obtained. "This animal," he says, "is fastened to the upper and lower shells by two white flat pieces of muscular substance, which are called by Houttuin *ears*, and extend about two inches from the thick part of the body, growing gradually thinner. The extremity of each ear lies loose, and is surrounded by a double brown fringed line. These lie almost the third of an inch from the outer part of the shell, and are continually moved by the animal. Next to these, above and below, are situated two other double fringed moveable substances, like the bronchiæ of a fish. These ears and fringes are joined to a cylindrical piece of flesh, of the size of a man's thumb, which is harder, and of a more muscular nature than the rest of the body. It lies about the centre of the shells, and is firmly attached to the middle of each. This, in fact, is that part of the pearl fish which serves

erves to open and shut the shells. Where this column is fastened, we find on the flesh deep impressions, and on the shell various nodes of round or oblong forms, like imperfect pearls. Between this part, and the hinge (*cardo*), lies the principal body of the animal, separated from the rest, and shaped like a bag. The mouth is near the hinge of the shell, enveloped in a veil, and has a double flap or lip on each side; from whence we observe the throat (*œsophagus*) descending like a thread to the stomach. Close to the mouth there is a carved brownish tongue, half an inch in length, with an obtuse point; on the concave side of this descends a furrow, which the animal opens and shuts, and probably uses to convey food to its mouth. The tongue is supposed to be used in the exercise of the locomotive power of the pearl-fish. That they have this power is well known to the divers, who observe that they alter their abode in search of food, and also when disturbed by an enemy. In the latter case, it is said, they commonly descend from the summit of the bank to its declivity. Near the middle of the tongue are two blueish spots, which seem to be the eyes. In a pretty deep hole near the base of the tongue, lies the beard (*byssus*), fastened by two fleshy roots, and consisting of almost one hundred fibres, each an inch long, of a dark green colour, with a metallic lustre; they are undivided, parallel, and flattened. In general the byssus is more than three quarters of an inch, without the cleft (*rima*); but if the animal is disturbed, it contracts it considerably. The top of each of these threads terminates in a circular gland or head, like the stigma of many plants. With this byssus they fasten themselves to rocks, corals, and other solid bodies; by it the young pearl fish cling to the old ones; and with it the animal procures its food, by extending and contracting it at pleasure. Small shell-fish, on which they partly live, are often found clinging to the former. The stomach lies close to the root of the beard, and has, on its lower side, a protruded obtuse point. Above the stomach are two small red bodies, like lungs; and from the stomach goes a long channel or gut, which takes a circuit round the muscular column above-mentioned, and ends in the anus, which lies opposite to the mouth, and is covered with a small thin leaf, like a flap. Though the natives pretend to distinguish the sexes by the appearance of the shell, I could not find any genitalia. The large flat ones they call males, and those that are thick, concave, and vaulted, they call females, or *pedoo-chippy*; but, on a close inspection, I could not observe any visible sexual difference.

“It is remarkable that some of these animals are as red as blood, and that the inside of the shell has the same colour, with the usual pearly lustre, though my servants found a reddish pearl in an oyster of this colour; yet such an event is very rare. The divers attribute this redness to the sickness of the pearl fish; though it is most probable that they had it from their first existence. In the shade they will live twenty-four hours after being taken out of the water. This animal is eaten by the lower class of Indians, either fresh in their curries, or cured by drying; in which state they are exported to the coast; though I do not think them by any means palatable.

“The pearls are only in the softer part of the animal, and never in that firm muscular column above-mentioned. We find them in general near the earth, and on both sides of the mouth.”

The formation of pearls has puzzled both ancient and modern naturalists, and given occasion to a great number of hypotheses, many of them wild and extravagant enough.

Pliny, and from him Solinus, &c. will have them to be formed of the dew: the fish, say they, rises every morning

to the surface of the water, and there opens its shell, to imbibe the dew of heaven; which, like a liquid pearl, insinuating into the body of the pearl-oyster, fixes by its salts, and there assumes the colour, hardness, and form of pearl; as some other liquors are converted into crystals in the earth, or the juice of flowers into honey and wax in the body of the bee; but the pearl-oysters grow fast to the rocks, and nobody ever yet saw any of them appear on the surface of the water.

The same absurd opinion is maintained by the natives of Ceylon, and very similar to it is the account of the formation of pearls recorded in one of the Sanscrit books of the Brahmans.

Others will have pearls to be the eggs of the fishes they are found in; but neither does this con- sult with the phenomena: for pearls are found throughout the whole substance of the oyster; in the head, the coat that covers it, the circular muscles that terminate in the stomach, and, in general, all the fleshy and muscular parts; so that there is no appearance that pearls should be in the oysters, what the eggs and spawn are in fowls and fishes. For besides that there is no particular place destined for their formation, anatomists have not been able to find any thing about them that bears any relation to what passes in this respect in other animals.

Mr. Chemnitz, a celebrated conchologist at Copenhagen, supposes that the pearl is formed by the oyster, in order to defend itself from the attacks of the *pholades* and *boreworms*. But we may be assured that in this supposition he mistakes; for although these animals often penetrate the lower layers of the pearl shell, and there occasion hollow nodes, yet on examination it will be found, that they are never able to pierce the firm layer with which the inside of the shell is lined. How then can the pearls be formed as a defence against exterior worms, when, even on shells that contain them, no worm-holes are to be seen? It is, therefore, more probable these worms take up their habitations in the nodes, in order to protect themselves from the attacks of an enemy, than that they are capable of preying on an animal so well defended as the pearl-fish is.

Others with M. Geoffroy the younger, rank pearls among the bezoars; as comprehending, under that class, all stones formed in layers or strata in the bodies of animals. See BEZOAR.

M. Reaumur has a very curious piece on the subject of the formation both of the shells and pearls, in the Memoirs of the French Academy, anno 1717. He observes that pearls are formed like other stones in the animals; as those, *c. gr.* in the bladder, kidneys, &c. and that they are apparently the effects of a disease of the fish. In effect, they are all formed of a juice extravasated out of some broken vessels, and detained, and fixed among the membranes.

To evince the possibility of this, he shews that the shells of sea-fish, as well as those of snails, &c. are wholly formed of a glutinous stony matter, oozing out of the body of the animal. Now it is no wonder that an animal, which has vessels wherein circulates a sufficient quantity of stony juice to build, thicken, and extend a shell, should have enough to form stones also, in case the juice, destined for the growth of the shell, shall chance to overflow, and burst forth in any cavity of the body, or among the membranes.

To confirm this system, he observes, that the inner surface of the common pearl-muscle, found on the coasts of Provence, is of a pearl, or mother of pearl colour, from one part of its extent, which he determines, to another; after which it becomes reddish: now there are pearls of two colours found in the shell; and the colours of the pearls

are precisely the same with those of the shell; nay, more, each kind of coloured pearl is found in the corresponding coloured part of the shell; which shews, that, in the same place wherein the transpiration of a certain juice had formed, and would have continued to form a coat or layer of shell of a certain colour; the vessels which conveyed that juice being broken, there is formed a little mass or collection of the juice, which, hardening, becomes a pearl of the same colour with the part of the shell to which it corresponds.

Add to this, that the silver, or pearl-coloured part of the shell, is formed of strata, or layers, over one another, like an onion; and the reddish part of little cylindrical short fibres applied against one another. The pearls of the two colours have also this difference of texture; not but they are both composed of concentric couches; but those of the reddish pearls are much less sensible; and, besides, they have threads, which, like radii, proceed from their centre to their circumference. These circumstances seem effectually to determine the formation of pearls, and to establish the new system beyond contradiction.

The extravasations above-mentioned may be caused by heterogeneous bodies, such as sand, coming in with the food, which the animal, to prevent disagreeable friction, covers with its glutinous matter, and which, as it is successively secreted, forms many regular lamellæ, in the manner of the coats of an onion, or like different strata of bezoars, only much thinner; this is probable, for if we cut through the centre of a pearl, we often find a foreign particle, which ought to be considered as the nucleus, or primary cause of its formation. The loose pearls may originally have been produced within the body, and on their increase may have separated and fallen into the cavity of the shell. Those compact ones, fixed to the shells, seem to be produced by similar extravasation, occasioned by the friction of some roughness on the inside of the shell. The frie and the pearl-like nodes have a different aspect from the pearls, and are of a darker and bluer colour. In one of the former we found a pretty large true oval pearl, of a very clear water, while the node itself was of a dark blueish colour. The yellow or gold-coloured pearl, is the most esteemed by the natives; some have a bright red lustre; others are grey or blackish, without any shining appearance, and of no value. Sometimes when the grey lamella of a pearl is taken off, under it is found a beautiful genuine one, but it oftener happens that after having separated the first coat, you find a worthless impure pearl. We tried several of them, taking one lamella off after another, and found clear and impure by turns; and in an impure pearl we met with one of a clear water, though in the centre of all we found a foreign particle. The largest and most perfect pearl which we saw during our stay at Condatchy, was about the size of a small pistol-bullet, though we have been told since our departure, many others of the same size have been found. The spotted and irregular ones are sold cheap, and are chiefly used by the native physicians as an ingredient in their medicines.

As to the formation of the pearl-fish, though it is the most natural opinion, that this fish, like all others, produces eggs or spawn, whose exterior surface at first is soft and viscous, but changes, and hardens, by degrees, into a shell; yet we must not leave unmentioned the popular, though erroneous hypothesis, of the Parawas; viz. that in rainy weather, the brooks of the neighbouring lands that empty themselves all along the coasts, run near two leagues on the surface of the sea without mixing therewith. For a while the suspended water, they say, retains its natural colour and sweetness: but at length, the heat of the sun, condensing

it, forms it into a kind of light transparent froth; this done, it presently divides into an infinity of parts, each of which appears as if animated; moving this way and that like insects. The fishes sometimes catch at them as they pass by; but they soon abandon them. By degrees their skin thickening and hardening, they at length become heavy enough to sink to the bottom, and assume the figure of pearl-oysters.

We may judge with greater or less probability by the appearance of the pearl-shells, whether they contain pearls or not. Those that have a thick calcareous crust upon them, to which zoophytes of various kinds are fastened, have arrived at their full growth, and commonly contain the best pearls; but those that appear smooth, contain either none, or only small ones.

The art of forcing shell-fish to produce pearls was known, in the first centuries of the Christian era, to the inhabitants of the coasts of the Red sea, as we are told by the philosopher Apollonius, (Philosrat. in Vita Apollon. lib. iii. c. 57, edit. Olearii, p. 139) who thought that circumstance worthy of particular notice. The Indians dived into the sea, after they had rendered it calm, and perhaps clearer, by pouring oil into it. They then enticed the fish by means of some bait to open their shells; and having pricked them with a sharp-pointed instrument, received the liquor that flowed from them, in small holes made in an iron vessel, in which they hardened into real pearls. Olearius says, that this account is to be found in no other author: but it has at least been copied by Tzetzes, whose words may in some measure serve as an explanation. Tzetzes Variorum, lib. ii. segm. 373.

We are as yet too little acquainted with shell-fish to be able to determine with certainty, how much truth there really may be in this relation: but we have great reason to conjecture from it, that the people who lived on the borders of the Red sea were then acquainted with the method of forcing shell-fish to produce pearls; and as the arts in general of the ancient Indians have been preserved without much variation, the process employed by the Chinese at present, to cause a certain kind of muscles to form pearls, seems to confirm the account given by Philostratus. In the beginning of the summer, at the time when the muscles repair to the surface of the water and open their shells, five or six small beads, made of mother of pearl, and strung on a thread, are thrown into each of them. At the end of a year, when the muscles are drawn up and opened, the beads are found covered with a pearly crust, in such a manner, that they have a perfect resemblance to real pearls. The truth of this information cannot be doubted, though some experiments made in Bohemia for the same purpose were not attended with success. It has been confirmed by various persons, and it is very probable, that some operations and secrets, without which the process would prove fruitless even in China, may be unknown to the Europeans. Besides, many observations are known, which seem to shew the possibility of such an effect being produced. Professor Fabricius says, that he saw in the possession of sir Joseph Banks, at London, large chamæ, brought from China, in which there were several bits of iron wire, incrustrated with a substance of a perfect pearly nature. These bits of wire, he said, had been sharp, and it appeared as if the muscles, to secure themselves against the points of the wire, had covered them with this substance, by which means they had been rendered blunt. May not therefore the process employed by the ancients be still practised? And may not these bits of wire have been the same as those spikes used by the people in the neighbourhood of the Red sea for pricking muscles, and which per-

haps slipped from the hands of the Chinese workmen and remained in the animals?

The invention therefore of Linnæus cannot be called altogether new. That great man informed the king and council in the year 1761, that he had discovered an art by which muscles might be made to produce pearls, and he offered to disclose the method for the benefit of the kingdom. This however was not done, but he disposed of his secret to one Bagge, a merchant at Gottenburg, for the sum of eighteen thousand copper dollars, which make about five hundred ducats. In the year 1780, the heirs of this merchant wished to sell to the highest bidder the sealed up receipt: but whether the paper was purchased, or who bought it, we do not know; for professor Retzius at Lund, of whom we enquired respecting it, could not inform us. Dr. Stover, in his Life of Linnæus, vol. i. p. 360, says that the manuscript containing this secret is in the possession of Dr. J. E. Smith, in England. In the year 1763, it was said in the German newspapers, that Linnæus was ennobled on account of this discovery, and that he bore a pearl in his coat of arms; but both these assertions are false, though professor Fabricius conjectures that the first may be true. Linnæus received his patent of nobility, which, together with his arms, we have seen, in the year 1756, consequently long before he said any thing respecting that discovery, of which the patent does not make the least mention. What in his arms has been taken for a pearl, is an egg, by which Mr. Tilas, whose business it then was to blazon the arms of ennobled families, meant to represent all nature, after the manner of the ancient Egyptians. The arms are divided into three fields, each of which, by the colour which forms the ground, expresses one of the kingdoms of nature; the red signifying the animal, and the green the vegetable, &c. Over the helmet, by way of crest, is placed the *linnaea*: that beautiful little moth, the *phalæna linneella*, shining with its silvery colours, is displayed around the border instead of festoons; and below is the following motto, "Famam extendere factis." Linnæus once shewed us, among his collection of shells, a small box filled with pearls, and said, "Hos unioes confecti artificio meo; sunt tantum quinque annorum, et tamen tam magni." "These pearls I made by my art, and though so large, they are only five years old." They were deposited near the *mya margaritifera*, from which most of the Swedish pearls are procured; and the son, who was however not acquainted with his father's secret, said the experiments were made only on this kind of muscle, though Linnæus himself assured us that they would succeed on all kinds.

We conjecture that Linnæus alluded to this art in his writings so early as the year 1746, or long before he ever thought of keeping it a secret. The passage we mean is in the sixth edition of his "Systema Naturæ," where he says "Margarita. Testæ excrecentia latere interiore, dum exterius latus perforatur." See the article LINNÆUS.

That pearls are produced when the shells have been pierced or injured in a certain manner, is highly probable, and has been in modern times often remarked. It appears also, that the animal has the power of sometimes filling up such openings with a calcareous substance, which it deposits in them. This substance assumes the figure of the orifice, and the animal particles it contains give it its brightness and lustre. Pearl-fishers have long known that muscles, the shells of which are rough and irregular, or which exhibit marks of violence, commonly contain pearls, though they are found also in others, in which the same appearances are not observed. We are perfectly aware that experiments which some have made by piercing the shells of muscles, have been unsuccessful; but this does not prove that it is impossible to

procure pearls in that manner. Those who made them did not perhaps pierce the proper part of the shell; perhaps they made the orifice so large that it weakened the animal; and they may not have chosen the properest season of the year. The strongest objection, however, which can be made on this subject, is the undeniable truth that the proper valuable pearls are not found adhering to the shell, but in the body only; and that therefore those calcareous balls which fill up holes, cannot be perfect pearls. But from the words of Linnæus above quoted, we are led to conjecture, that he only made a hole in the shell without piercing it quite through. Linnæus also may have done some injury to the animal itself, when it opened its shell; for it is certain that testaceous animals are strong-lived, and can easily sustain any violence. It appears by the Transactions of the Swedish Academy, that some have been of opinion that shell-fish might be made to produce pearls by a particular kind of nourishment; and Lister thinks that these excrescences would be more abundant, were the muscles placed in water impregnated with calcareous matter; but professor Linnæus seems certain that his father employed none of these methods. Beckmann's Hist. of Inventions, vol. ii.

The perfection of pearls, whether round, in form of pearls or olives, or irregular, consists chiefly in the lustre and clearness of the colour, which jewellers call the *water*. There are some whose water is white, which are those most esteemed in Europe; the waters of others border on the yellow, which some Indians and Arabs prefer to the white; others are of a lead colour; others border on black; and others are quite black. They are all liable to change with wearing: in eighty or a hundred years they usually become of little value, especially the white ones, which often turn yellow, and spoil in forty or fifty years' time.

The difference of colours, doubtless, arises from the different parts of the oyster in which they are formed. When the seed happens to be thrown into the mesentery or liver, or the parts corresponding thereto, it is no wonder if the impurities of the blood change the natural white.

The oriental pearls are the finest, on account of their largeness, colour, and beauty, being of a silver white; whereas the occidental pearls seldom exceed the colour of milk.

In Europe pearls are sold by the carat-weight, the carat containing four grains. In Asia, the weights used for pearls are different, in different states.

The value of pearls increases as the square of their weight: thus, the price of a pearl of one carat being settled at 8s. to find the price of a pearl weighing six carats; first find the square of 6, *viz.* 36: which multiplied by 8, gives 288 shillings, or 14*l.* 8s. the price required.

The term pearl is only properly applied to what grows independent of the shell. The shell itself is rather called *nacre of pearl*: those pieces which have grown thereto, and have since been separated by the address of the workman, are called *scabs of pearls*; which are, in effect, nothing but roundish excrescences, or pieces of the shell, though frequently used for real pearl.

Pearls, F. Bouhours observes, have this advantage over precious stones dug out of rocks, &c. that the latter owe their lustre to the industry of men; nature only, as it were, hews them out, and leaves the finishing of them to art: but the former are born with that beautiful water which gives them their value. They are found perfectly polished in the abysses of the sea; and nature has put the last hand to them before they are separated from their mother.

Pearls have been used as ornaments from the earliest ages.

PEARL-FISHERY.

In the time of Job pearls were accounted to be of great value. Job, ch. xxviii. v. 18.

Pearls of unusual figures, *i. e.* neither round, nor in the pear form, are called *barognas*, and our's *Scotch pearls*: those of unusual sizes are called *parangons*; such as were that of Cleopatra, valued by Pliny at centies HS, or 80,000*l.* sterling; that brought in 1574 to Philip II. of the size of a pigeon's egg, valued at 14,400 ducats; that of the emperor Rudolph, mentioned by Boetius, called *la peregrina*, or *the incomparable*, of the shape of a muscade pear, and weighing thirty carats; and that mentioned by Tavernier, in the hands of the emperor of Persia, in 1633, bought of an Arab for 32,000 tomans, which, at 3*l.* 9*s.* the toman, amounts to 110,400*l.* sterling.

That pearls are calcareous is inferred from Cleopatra's having been able to dissolve her's in vinegar, and by these means to gain a wager from her lover, as we are told by Pliny (lib. ix. cap. 35.), and Macrobius (Saturn. lib. ii. cap. 15.) She must, however, have employed stronger vinegar than that which we use for our tables, as the pearls, on account of their hardness and their natural enamel, cannot be easily dissolved by a weak acid. Cleopatra, perhaps, broke and pounded the pearls; and it is probable that she afterwards diluted the vinegar with water, that she might be able to drink it; though dissolved calx destroys acids and renders them imperceptible to the tongue. We are told that the dissipated Clodius gave to each of his guests a pearl dissolved in vinegar to drink; "ut experiretur in gloria palati," says Pliny, "quid saperent margaritæ; atque ut mirè placuere, ne solus hoc sciret, singulos uniones convivis absorbendos dedit." Horace (lib. ii. sat. 3.) says the same. Caligula, also, "margaritas pretiosissimas aceto liquefactas forbebat." Suet. cap. 37. That pearls are soluble in vinegar is remarked in Pausanias, l. viii. c. 18. and Vitruvius, l. viii. c. 3.

Pearls have been reckoned of some use in medicine; but they were only the smallest sort, called *seeds of pearls*, that were used. The quality required was, that they should be white, clear, and transparent; and truly oriental. They served to make cordial potions, formerly much valued, but now fallen from their ancient reputation; and scarcely ordered by any but charlatans.

The ladies also use certain preparations of pearls, as they are made to believe, for their complexions: such as the whites of pearls; flowers, essences, spirits, tinctures, &c. of pearl; but they are all apparently deceits.

PEARLS, Ounce. See OUNCE.

PEARL-FISHERY. Pearls are taken in the seas of the East Indies, in those of America, and in some parts of Europe.

PEARL-FISHERIES OF THE EAST ARE, 1. The island of Bahrein, or Baharem, in the Persian gulf; this the Portuguese were masters of while they held Ormus and Mascati; but it has been returned to the sopher of Persia, since the time that prince, with the assistance of the English, took from them Ormus, and the Arabs Mascati. The revenue arising from this fishery to the sopher of Busheer, has been diminished by the pretensions of the Houls, a strong Arabian tribe between Gombroon and Cape Burdistan, who refused to pay for the permission of fishing. See BAHREIN.

2. The fishery of Catifa, on the coast of Arabia Felix, over-against Bahrein.

3. That of Manaar, a sea-port in the isle of Ceylon. The pearls here fished are the finest in all the East for their water, and roundness; but they seldom exceed two carats. See *Manner of Fishing for PEARLS in the East Indies*, farther on.

Lastly, there are pearls fished on the coast of Japan; but they are coarse and irregular, and little valued.

The pearls of Bahrein and Catifa are those that were formerly sold in the Indies; they border a little on the yellow, but the Eastern people do not value them the less for it: they esteem it the sign of their being ripe, and mature; and are persuaded, that those which have this yellowish tincture naturally never change their colour; and that, on the contrary, those of the white water do not hold above thirty years before the pearl assumes a filthy yellow colour, by reason of the heat of the climate, and the sweat of the persons who wear them. Some of the pearls, taken near the isles of Bahrein on the Arabian side, weigh 50 grains, but those are esteemed large which weigh from 10 to 12 grains.

PEARL, American, Fisheries, are all in the great gulf of Mexico, along the coast of the Terra Firma. There are five of them.

1. The fishery of Cubagua, an island five leagues from New Andalusia, in 10½ deg. north lat.

2. That of the island Marguerites, or Pearl Island.

3. That of Comogote near the Terra Firma.

4. That of the river De la Hach, called La Reneheria.

5. That of St. Martha, sixty leagues from the river de la Hach.

The pearls of these three last fisheries are usually of a good weight, but ill formed and of a livid water. Those of Cubagua seldom exceed five carats, but are found in abundance. But the greatest quantity, and the finest, both with regard to weight and water, are those of the island of Marguerites.

PEARL-FISHERY, in Chinese Tartary, is near the city Nipehoa, situate on a lake of the same name: the pearls here are less beautiful than those of Baharem, and the fishery less plentiful. It was this fishery that occasioned the war between the Chinese and Muscovites, terminated towards the end of the 17th century, by the Jesuits Pereira and Gerbillon; when the lake, which is of great extent, was divided between the two nations, each of which had pretended to the whole.

The Turks or Tartars call this valued product "Margion," signifying a globe of light; from which, and the Persian name "Mervarid," *i. e.* the offspring of light, was derived "Marguerite," the appellation in southern Europe.

There are some pearl fisheries also in the South sea, but they are very inconsiderable. The fisheries of the Bornean islands were noted in the time of Magalhaens; Pigafetta, his companion, reporting, that a Bornean monarch possessed two pearls, found here, as large as pullets' eggs.

PEARL-FISHERIES OF EUROPE are in some places on the coast of Scotland, particularly in the rivers Teith and Ythan, which furnish a large kind of mya or muscle, and pearls, some of which are in the shape of a pear, and others pink on one side; and in a river of Saxony called Elster, where the shells are about six inches long, but the pearls found here are no ways comparable to those of the East Indies, or of America; though they serve for necklaces, which are sold sometimes for a thousand crowns, and upwards. See an account of pearl fishing, in the north of Ireland, Philos. Transl. N^o 198.

PEARLS, *Manner of fishing for, in the East Indies; particularly in the isle of Ceylon.* About 12 miles from Manaar, and in the gulf so called, lies the bay of Condatchy, where all the boats are collected for the pearl-fishery. At this time the bay is crowded with small vessels, and the beach presents an astonishing multitude of people from every quarter of India. Several thousands of people

PEARL-FISHERY.

of different colours, countries, casts, and occupations, continually passing and repassing; vast numbers of small tents and huts erected on the shore, with the bazar or market place before them; a multitude of boats returning in the afternoon from the pearl banks; the anxious countenances of the boat-owners, while the boats are approaching the shore, and the eagerness and avidity with which they run to them when arrived, in hopes of a rich cargo; the vast number of jewellers, brokers, merchants, of all colours and all descriptions, both natives and foreigners, who are occupied in some way or other with the pearls, some separating and assorting them, others weighing and ascertaining their number and value, while others are hawking them about, or drilling and boring them for future use:—all these circumstances tend to impress the mind with the value and importance of that object, which can of itself create this scene. The banks, where the fishery is carried on, extend several miles along the coast from Manaar southward of Arippe, Condatchy, and Pomparipo. The principal bank is opposite to Condatchy, and lies out at sea about 20 miles. The first business, previous to the commencement of the fishery, is to survey the different oyster banks, to ascertain the state of the oysters, and to make a report on the subject to government. If the quantity is found to be sufficient, and in a proper state of maturity, the particular banks to be fished that year are put up for sale to the highest bidder, and are usually purchased by a black merchant. Sometimes the government deems it more advantageous to fish the banks on its own account, and to dispose of the pearls afterwards to the merchants. When this plan is adopted, boats are hired for the season on account of government from different quarters, at a variable price, but usually from five to eight hundred pagodas for each boat. When this plan was pursued, as it generally was by the Dutch, the governor and council of Ceylon claimed a certain *per centage* on the value of the pearls:—or if the fishing of the banks was disposed of by public sale, they bargained for a stipulated sum to themselves over and above what was paid on account of government. This perquisite was claimed on account of their trouble in surveying and valuing the banks. As it would not be expedient to fish the whole of the banks in one year, they are divided into three or four different portions, one portion of which is fished annually in succession. By this contrivance a sufficient interval is allowed for the oysters to attain their proper growth; and as the portion first used generally recovers its maturity by the time the last portion has been fished, the fishery becomes almost regularly annual. The oysters are supposed to attain their completest state of maturity in seven years; for if they be left too long, the pearls become so large and so disagreeable to the fishes, that they vomit and throw them out of the shell.

The fishing season commences in February, and ends about the beginning of April. The period allowed the merchant for fishing the banks is six weeks, or at the most two months; but the interruptions that occur prevent the fishing days from exceeding more than about 30. In a bad season, the purchaser of the fishery is allowed a few days more as a favour. The number of holidays observed by persons of different nations and sects, is one principal cause of a considerable interruption. Many of the divers are of a black race, denominated Marawas and Parawas, that inhabit the opposite coast of Tutucoreen: these people, though of the Malabar cast, are Roman Catholics, and leave off work on Sundays to attend prayers at the chapel of Arippe. But if stormy days, or Hindoo and Mahometan festivals (which are never neglected on any account by the natives) occur to interrupt the regular course of fishing, the farmer is some-

times desirous that the Catholic Marawas should make up for lost time by working on Sundays; but he cannot compel them to do this without an order from the chief civil officer of the government, who is appointed to superintend the fishery. The boats and donies employed in the fishery do not belong to Ceylon, but are brought thither from different parts of the continent; particularly Tutucoreen, Caracal, and Negapatam, on the Coromandel coast; and Colang, a small place on the Malabar coast, between Cape Comorin and Anjanga. The divers from Colang are accounted the best, and are only rivalled by the Lubbahs, a tribe of Moors, who remain on the island of Manaar, in order to be trained in this art. Before the fishery begins all the boats rendezvous at Condatchy, and are here numbered and contracted for.

During the season, all the boats regularly sail out and return together. A signal gun is fired at Arippe about ten o'clock at night, when the whole fleet sets sail with the land-breeze. They reach the banks before day-break, and at sun-rise commence fishing. In this they continue busily occupied till the sea-breeze, which arises about noon, warns them to return to the bay. As soon as they appear within sight, another gun is fired, and the colours hoisted, to inform the anxious owners of their return. When the boats come to land, their cargoes are immediately taken out, as it is necessary to have them completely unloaded before night. Whatever may have been the success of their boats, the owners seldom wear the looks of disappointment; for, although they may have been unsuccessful one day, they look with the most complete assurance of better fortune to the next; as the Brahmins and conjurers, whom they implicitly trust in defiance of all experience, understand too well the liberality of a man in hopes of good fortune, not to promise them all they can desire.

Each of the boats carries twenty men, with a *Tindal* or chief boatmen, who acts as pilot. Ten of the men row and assist the divers in re-ascending. The other ten are divers; they go down into the sea by five at a time; when the first five come up the other five go down; and, by this method of alternately diving, they give each other time to recruit themselves for a fresh plunge.

In order to accelerate the descent of the divers, large stones are employed: five of these are brought in each boat for the purpose; they are of a reddish granite, common in this country, and of a pyramidal shape, round at top and bottom, with a hole perforated through the smaller end sufficient to admit a rope. Some of the divers use a stone shaped like a half moon, which they fasten round the belly when they mean to descend, and thus keep their feet free.

These people are accustomed to dive from their very infancy, and fearlessly descend to the bottom in from four to ten fathoms water, in search of the oysters. The diver, when he is about to plunge, seizes the rope, to which one of the stones we have described is attached, with the toes of his right foot, while he takes hold of a bag of net-work with those of his left; it being customary among all the Indians to use their toes in working or holding as well as their fingers; and such is the power of habit, that they can pick up even the smallest thing from the ground with their toes almost as nimbly as an European could with his fingers. The diver, thus prepared, seizes another rope with his right hand, and holding his nostrils shut with the left, plunges into the water, and by the assistance of the stone speedily reaches the bottom. He then hangs the net round his neck, and with much dexterity, and all possible dispatch, collects as many oysters as he can while he is able to remain under water, which is usually about two minutes. He then resumes his former position, makes a signal to those above by pulling

PEARL-FISHERY.

the rope in his right hand, and is immediately by this means drawn up and brought into the boat, leaving the stone to be pulled up afterwards by the rope attached to it.

The exertion undergone during this process is so violent, that, upon being brought into the boat, the divers discharge water from their mouths, ears, and nostrils, and frequently even blood. But this does not hinder them from going down again in their turn. They will often make from forty to fifty plunges in one day; and at each plunge bring up about a hundred oysters. Some rub their bodies over with oil, and stuff their ears and noses to prevent the water from entering; while others use no precautions whatever. Although the usual time of remaining under water does not much exceed two minutes, yet there are instances known of divers who could remain four and even five minutes, which was the case with a Caffre boy the last year we visited the fishery. The longest instance ever known was that of a diver who came from Anjanga in 1797, and who absolutely remained under water full six minutes.

This business of a diver, which appears so extraordinary and full of danger to an European, becomes quite familiar to an Indian, owing to the natural suppleness of his limbs, and his habits from his infancy. His chief terror and risk arise from falling in with the ground-shark while at the bottom. This animal is a common and terrible inhabitant of all the seas in these latitudes, and is a source of perpetual uneasiness to the adventurous Indian. Some of the divers, however, are so skilful as to avoid the shark even when they remain under water for a considerable time. But the terrors of this foe are so continually before their eyes, and the uncertainty of escaping him so great, that these superstitious people seek for safety in supernatural means. Before they begin diving, the priest, or conjurer, is always consulted, and whatever he says to them is received with the most implicit confidence. The preparation which he enjoins them consists of certain ceremonies according to the cast and sect to which they belong, and on the exact performance of these they lay the greatest stress. Their belief in the efficacy of these superstitious rites can never be removed, however different the event may be from the predictions of their deluders: government therefore wisely gives way to their prejudices, and always keeps in pay some conjurers to attend the divers and remove their fears. For though these people are so skilful and so much masters of their art, yet they will not on any account descend till the conjurer has performed his ceremonies. His advices are religiously observed, and generally have a tendency to preserve the health of the devotee. The diver is usually enjoined to abstain from eating before he goes to plunge, and to bathe himself in fresh water immediately after his return from the labours of the day.

The conjurers are known in the Malabar language by the name of *Pillal Karras*, or *binders of sharks*. During the time of the fishery, they stand on the shore from the morning till the boats return in the afternoon, all the while muttering prayers, distorting their bodies into various strange attitudes, and performing ceremonies to which no one, not even themselves we believe, can attach any meaning. All this while it is necessary for them to abstain from food or drink, otherwise their prayers would be of no avail. These acts of abstinence, however, they sometimes dispense with, and regale themselves with *toddy*, a species of liquor distilled from the palm tree, till they are no longer able to stand at their devotions.

Some of the conjurers frequently go in the boats with the divers, who are greatly delighted at the idea of having their protectors along with them; but in our opinion, this fancied protection renders the divers more liable to accidents, as it

induces them to venture too much and without proper precautions, in full confidence of the infallible power of their guardians. It must not however be imagined that these conjurers are altogether the dupes of their own arts, or that they accompany their votaries to the fishery merely from an anxious care of their safety; their principal purpose in going thither is, if possible, to fish a valuable pearl. As this is the case, it is evident that the superintendent of the fishery must look upon their voyages with a jealous eye; such, however, is the devoted attachment of their votaries, that he is obliged to pass it over in silence, or at least to conceal his suspicions of their real intentions. He must also never hint a doubt of their power over the sharks, as this might render the divers scrupulous of committing themselves to the deep, or indeed deter them from fishing at all. The conjurers reap here a rich harvest; for, besides being paid by the government, they get money and presents of all sorts from the black merchants and those successful in fishing up the oysters.

The appearance of a single shark is sufficient to spread dismay among the whole body of divers; for as soon as one of them sees a shark he instantly gives the alarm to his companions, who as quickly communicate it to the other boats; a panic speedily seizes the whole, and they often return to the bay without fishing any more for that day. The sharks which create all this alarm sometimes turn out to be nothing more than a sharp stone on which the divers happen to alight. As false alarms excited in this manner prove very injurious to the progress of the fishery, every means is employed to ascertain whether they are well or ill founded; and if the latter be the case, the authors of them are punished. These false alarms occurred more than once in the course of the last two or three seasons.

The divers are paid differently according to their private agreement with the boat-owners. They are paid either in money, or with a proportion of the oysters caught, which they take the chance of opening on their own account; the latter is the method most commonly adopted. The agreements with the people who hire out the boats are conducted much in the same manner. They contract either to receive a certain sum for the use of their boats, or pay the chief farmer of the banks a certain sum for permission to fish on their own account. Some of those who pursue the latter plan are very successful and become rich; while others are great losers by the speculation. Oyster lotteries are carried on here to a great extent; they consist of purchasing a quantity of the oysters unopened, and running the chance of either finding or not finding pearls in them. The European officers and gentlemen, who attend here upon duty or through curiosity, are particularly fond of these lotteries, and very frequently make purchases of this sort.

The boat-owners and merchants are very apt to lose many of the best pearls while the boats are on their return to the bay from the banks, as the oysters, when alive and left for some time undisturbed, frequently open their shells of their own accord: a pearl may then be easily discovered, and the oyster prevented by means of a bit of grass or soft wood from again closing its shell, till an opportunity offers of picking out the pearl. Those fellows who are employed to search among the fish also commit many depredations, and even swallow the pearls to conceal them; when this is suspected, the plan followed by the merchants is to lock the fellows up, and give them strong emetics and purgatives, which have frequently the effect of discovering the stolen goods.

As soon as the oysters are taken out of the boats, they are carried by the different people to whom they belong, and placed

placed in holes or pits dug in the ground to the depth of about two feet, or in small square places cleared and fenced round for the purpose; each person having his own separate division. Mats are spread below them to prevent the oysters from touching the earth; and here they are left to die and rot. As soon as they have passed through a state of putrefaction, and have become dry, they are easily opened without any danger of injuring the pearls, which might not be the case if they were opened fresh, as at that time to do so requires great force. On the shell being opened, the oyster is minutely examined for the pearls; it is usual even to boil the oyster, as the pearl, though commonly found in the shell, is not unfrequently contained in the body of the fish itself.

The stench occasioned by the oysters being left to putrefy is intolerable; and remains for a long while after the fishery is over. It corrupts the atmosphere for several miles round Condatchy, and renders the neighbourhood of that country extremely unpleasant till the monsoons and violent south-west winds set in and purify the air. The nauseous smell, however, is not able to overcome the hopes of gain: for months after the fishing season, numbers of people are to be seen earnestly searching and poring over the sands and places where the oysters had been laid to putrefy; and some are now and then fortunate enough to find a pearl that amply compensates their trouble in searching after them. In 1797 while Mr. Andrews was collector, a Cooly, or common fellow of the lowest class, got by accident the most valuable pearl seen that season, and sold it to Mr. Andrews for a large sum.

The pearls found at this fishery are of a whiter colour than those got in the gulf of Ormus, on the Arabian coast, but in other respects are not accounted so pure, or of such an excellent quality; for though the white pearls are more esteemed in Europe, the natives prefer those of a yellowish or golden cast. Off Tutucoreen, which lies on the Coromandel coast, nearly opposite to Condatchy, there is another fishery; but the pearls found there are much inferior to those two species we have mentioned, being tainted with a blue or greyish tinge.

In preparing the pearls, particularly in drilling and stringing them, the black people are wonderfully expert. We were very much struck with the instrument they employ in drilling, as well as the dexterity with which they use it. A machine made of wood, and of a shape resembling an obtuse inverted cone, about six inches in length, and four in breadth, is supported upon three feet, each twelve inches long. In the upper flat surface of this machine holes or pits are formed to receive the larger pearls, the smaller ones being beat in with a little wooden hammer. The drilling instruments are spindles of various sizes according to that of the pearls; they are turned round in a wooden head by means of a bow handle to which they are attached. The pearls being placed in the pits which we have already mentioned, and the point of the spindle adjusted to them, the workman presses on the wooden head of the machine with his left hand, while his right is employed in turning round the bow handle. During the process of drilling, he occasionally moistens the pearl by dipping the little finger of his right hand in a cocoa-nut filled with water, which is placed by him for that purpose; this he does with a dexterity and quickness which scarcely impedes the operation, and can only be acquired by much practice.

They have also a variety of other instruments both for cutting and drilling the pearls. To clean, round, and polish them to that state in which we see them, a powder made of the pearls themselves is employed. These different opera-

tions in preparing the pearls occupy a great number of the black men in various parts of the island. In the black town or pettah of Columbo in particular, many of them may every day be seen at this work, which is well worth the attention of any European who is not already acquainted with it.

As the pearl fishery has been formerly, without due consideration, exhausted by the avarice of the Dutch, it is not perhaps at present so productive as it once was. However, the revenue which government derives from it is still considerable, and may by good management be increased. Pearls are considered as the next staple of the island to cinnamon; the concourse of people attracted by it affords a facility for disposing of the other produce; and by proper management, advantage might be taken of the opportunity here offered to introduce British manufactures into various parts of India. Percival's Account of Ceylon. Asiatic Researches, vol. v. p. 393, &c.

PEARL, *Manner of fishing for, in the West Indies.* The season for fishing there is usually from October to March. In this time there set out from Carthagena ten or twelve barks, under the convoy of a man of war called l'Armada. Each bark has two or three slaves for divers.

Among the barks there is one called Capitana; to which all the rest are obliged to bring at night what they have caught in the day, to prevent frauds. The divers never live long, by reason of the great hardships they sustain; continuing sometimes under water above a quarter of an hour. The method is the same as in the East Indian fisheries.

The Indians esteemed pearls before the discovery of America; and when the Spaniards arrived there, they found great quantities stored up, which the Americans set great value on. But they were almost all imperfect, and their water yellow and smoky, because they used fire in opening the fishes.

As to pearls in form of pears, though equally perfect, and of equal weight with the round ones, their value is much inferior: however, when two are found that match well, their value is less but by one-third.

PEARLS, *To blanch and cleanse.* First soak and cleanse them in bran-water, then in milk-warm water, and last of all steep them in mercurial water, then string and hang them in a glass, close it well, and set them in the sun to dry.

The bran-water is made thus: boil two good handfuls of wheaten bran, in a quart of water, till all the strength of the bran is drawn out, which use thus: take a new glazed earthen pan, in which put your pearls on a string, and pour the third part of the bran-water upon it: when they have soaked, and the water is just warm, rub your pearls gently with your hands, to clean them the better, and continue this till the water is cold; throw off that, and pour on another third part of the bran-water, that is boiling, proceed with this as you did before, and when cold, throw it away, and pour on the remainder of the water, still proceeding as before. After this, heat fair water, and pour it on your pearls, to refresh them, and to wash away the remains of the bran, by shifting them, and pouring on fresh warm water: this do thrice, without handling your pearls; then lay them on a sheet of clean white paper, and dry them in a shade; after which dip them into mercurial water, to bring them to perfection. *Postl. Dict. Com.*

Other Methods in blanching of Pearls.—Pound alabaster to an impalpable powder, rub the pearls therewith, very gently: this will not only cleanse them, but if you let them remain in this powder twenty-four hours afterwards, they will still
be

be the better for it. White coral has the same effect, used in the like manner. White tartar, calcined and divested of all its moisture, is very good for the same purpose.

Salt dissolved, filtered, coagulated, well dried, and ground, is as effectual as any of the former things for cleansing of pearls, by rubbing them therewith; and if afterward you lay them up in some coarse ground millet, it will contribute to their brightness.

PEARLS, *False or Artificial*, are counterfeit or fictitious pearls, resembling the true ones in shape, lustre, colour, and polish; popularly called beads.

These anciently were only made of glass, incruited on the inside with a pearl-coloured varnish, which was first pursued by some artists at Murano; or with a kind of amalgam or coating of quicksilver withinside; afterwards they used small balls of wax or gum, covered with a pearl-coloured enamel. These were praised on account of their lustre; but as their beauty was destroyed by moisture, they did not continue long in use.

There has since been invented in France another manner of making them, so near the natural ones in lustre and water, that they deceive a good eye. These are what the ladies now generally wear in defect of true pearl; small necklaces whereof they despise, and the large ones are generally too dear.

PEARLS, *False, Method of making*. Take of thrice distilled vinegar two pounds; Venice turpentine, one pound; mix them together into a mass, and put them into a cucurbit; fit a head and receiver to it, and after you have luted the joints, set it, when dry, on a sand furnace, to distil the vinegar from it; do not give it too much heat, lest the stuff swell up: after this put the vinegar into another glass cucurbit, in which there is a quantity of seed pearl, wrapped in a piece of thin silk, but so as not to touch the vinegar; put a cover or head upon the cucurbit, lute it well, and put it in bal. Mariæ, where you may let it remain a fortnight. The heat of the balneum will raise the fumes of the vinegar, and they will soften the pearls in the silk, and bring them to the consistence of a paste; which being done, take them out, and mould them to what bigness, form, and shape you please. Your mould must be of fine silver, the inside gilt; you must also refrain from touching the paste with your fingers, but use silver gilt utensils, with which fill your moulds. When they are moulded, bore them through with a hog's bristle or gold wire, and let them dry a little; then thread them again on gold wire, and put them into a glass; close it up and set them in the sun to dry: after they are thoroughly dry, put them in a glass matras into a stream of running water, and leave them there twenty days; by that time they will contract the natural hardness and solidity of pearls: then take them out of the matras, and hang them in mercurial water, where they will moisten, swell, and assume their oriental beauty; after which shift them into a matras hermetically closed up, to prevent any water coming to them, and let it down into a well, to continue there about eight days: then draw the matras up, and in opening it, you will find pearls exactly resembling oriental ones.

The mercurial water is thus prepared: take plate-tin of Cornwall, calcine it, and let the calx be pure and fine; then, with one ounce of the calx and two ounces of prepared mercury, make an amalgam; wash it with fair water, till the water remains insipid and clear; then dry the amalgam thoroughly, put it into a matras over the furnace, giving it such a heat as is requisite for sublimation. When the matter is well sublimated, take off the matras, and let it cool.

Take out that sublimate, add one ounce of Venice sublimate to it, and grind them together on a marble; put this into another matras, close it well, and set it upside down in a pail of water, and the whole mass will dissolve itself, in a little time, into mercurial water: this done, filter it into a glass receiver, set it on a gentle ash fire to coagulate, and it will turn into a crystalline substance: beat this in a glass mortar, with a glass pestle, to a fine powder; strain it through a fine sieve, and put it into a matras, stop it close up, and place it in balneo Mariæ; there let it remain till it resolves again into water, which will be fit for the above mentioned use. *Postl. Dict. Com.*

The sieur Janin, or Jaquin, having observed, that the scales of a little fish called the *bleak*, found plentifully in the river Marne, had not only all the lustre of the real pearl, but that, after beating them to powder in water, they returned to their former brilliance upon drying; bethought himself of setting a piece, or little mass thereof, in the cavity of a bead, or grain of girasol, which is a kind of counterfeit opal made of glass, and bordering much on the colour of pearl. The difficulty was to get it there, and when it was within, to spread it equally throughout the bead.

A little glass tube, six or seven inches long, and a line and half in diameter, but very sharp at one end, and a little crooked, served for the introducing of the matter, by blowing it with the mouth, after having taken up a drop of this mixture with the pointed extremity of the tube; and to spread it throughout the inner circumference, he contented himself to shake it gently a long time, in a little osier basket lined with paper.

The pulverized scales, fastened by this motion in the inside of the bead, resume their lustre as they dry. To increase this lustre, in winter, they lay the beads in a hair sieve, or a bolting cloth, which they suspend to the ceiling, and under it, at six feet distance, they lay heaps of hot ashes. In summer they suspend them in the same manner, but without any fire.

The pearls, thus well dried, become very brilliant; and nothing remains but to stop up the aperture, which is done by melting wax, conveyed into it with a tube like that used in introducing the powdered scales.

After clearing off the superfluous wax, they perforate the pearls with a needle, and string them; and thus they form a necklace.

PEARL, *Mother of*, is the shell not of the pearl oyster, but of another sea-fish of the oyster kind.

The shell withinside is very smooth and polished, and of the whiteness and water of pearl itself; and it has the same lustre withoutside, after the first laminae or leaves, which make the outer coat of this rich shell-fish, have been cleared off with aqua fortis, and the lapidary's mill. It is used in inlaid works, and in several toys, as snuff-boxes, &c.

PEARL, *Wens of*, are certain excrescences, or prominent places, in form of half-pearls; sometimes found in the bottoms of pearl shells.

The lapidaries have the address to saw off these protuberances, to join them together, and to use them in several works of jewellery, as if they were real pearls.

PEARL, in *Heraldry*, is used by such as blazon with precious stones instead of colour and metals, for argent, or white.

PEARL, in *Ichthyology*, a name given by us in the parts about London, to that fish which is called in Cornwall, and other parts of the west of England, *lug-a-leaf*: it is the rhombus lævis of the generality of authors. See PLEURO-NECTES *Rhombus*.

PEARL Keys, in *Geography*, islets or rocks in the Spanish main, on the Mosquito shore. N. lat. $12^{\circ} 26'$. W. long. $82^{\circ} 45'$.

PEARL Key Lagoon, a bay on the Mosquito shore. N. lat. $11^{\circ} 15'$. W. long. $83^{\circ} 12'$.

PEARL Islands, a cluster of small islands in the Atlantic, near the coast of Nicaragua. N. lat. $12^{\circ} 35'$. W. long. $83^{\circ} 50'$.

PEARL Islands, or *King's Islands*, small islands in the bay of Panama; 12 leagues from the city of Panama. They are low, and produce wax, water, fruit, fowls, and hogs, and they afford good harbours for ships. N. lat. $7^{\circ} 12'$. W. long. $81^{\circ} 45'$.

PEARL Island, a small island in the gulf of Mexico, at the mouth of the Mississippi.—Also, a small island in the West Indies. N. lat. $14^{\circ} 53'$. W. long. $79^{\circ} 13'$.

PEARL River, a river of America, which rises in the Chactaw country in the W. part of the Mississippi territory, and pursuing a southerly course to the gulf of Mexico, is navigable upwards of 150 miles. Its principal mouths are near the entrance at the E. end of the Regulets, through which is the passage to lake Pontchartrain; it has seven feet at its entrance, and deep water afterwards. In 1769 there were some settlements on this river, where were raised tobacco, indigo, cotton, rice, Indian corn, and all sorts of vegetables. The land produces a variety of timber, fit for pipe and hoghead staves, masts, yards, and all kinds of planks for ship-building.—Also, a river of Chiampa, which runs into the Chinese sea, N. lat. $10^{\circ} 54'$. E. long. $107^{\circ} 33'$.

PEARL Rocks, a group of low and dangerous rocks in the North Pacific ocean, near the S. extremity of Calvert's island. N. lat. $51^{\circ} 54'$. E. long. $231^{\circ} 52'$.

PEARL-Ash, in *Chemistry, Arts, and Manufactures*. The crude potash, when first obtained by the combustion of vegetable matter, abounds with a great variety of impurities, consisting of neutral salts, sulphur, charcoal, and some earthy matter.

When this substance is washed with clean water, and the insoluble matter allowed to subside, the clear liquor is evaporated in large shallow iron pans. The residuum consists of potash properly so called, still containing some neutral salts, but free from its other impurities. It is a mass of a white colour, from which it is called pearl-ash. In this state it is used by bleachers, glass-makers, dyers, and others. The real potash it contains, for which it is valued, is combined with carbonic acid in the proportion of 19 of acid to 42 potash. The remainder consists of sulphat and muriat of potash. See *CARBONAT of Potash*.

The goodness of pearl-ashes must be distinguished by the uniform and white appearance of them: they are subject, however, to a common adulteration, not easily distinguishable by the appearance, which is done by the addition of common salt. In order to discover this fraud, take a small quantity of the suspected salt, and after it has been softened by lying in the air, put it over the fire in a shovel: if it contains any common salt, a crackling and kind of slight explosion will take place, as the salt grows hot.

The pearl-ashes are much used in the manufacture of glass, and require no preparation; except where very great transparency is required, as in the case of looking-glass, and the best window-glass. For this purpose dissolve them in four times their weight of boiling water: when they are dissolved, let the solution be put into a clean tub, and suffered to remain there twenty-four hours, or longer. Let the clear part of the fluid be then decanted off from the sediment, and put back into the iron pot in which the solu-

tion was made: in this let the water be evaporated away till the salts be left perfectly dry again. Keep those that are not designed for immediate use in stone jars, well secured from moisture and air.

To those who buy large quantities of this article, it may not be unuseful to know the means of assaying it. Weigh 100 grains of it before it has been exposed to the air; then lay out a known weight of sulphuric acid, of the specific gravity of 1.8, or such as boils at the temperature of 460° . Dissolve the pearl-ash in its own weight of distilled water. With a small sucking tube add sulphuric acid by a small portion at once, till no more effervescence takes place. The weight of the remainder of the sulphuric acid will shew how much has been added to the solution. Then for every grain of sulphuric acid of the above strength taken up, allow .82 of a grain of pure potash. Thus, if 100 grains of the pearl-ash take up 40 grains of sulphuric acid, of the specific gravity 1.8, the pure potash contained in the 100 will be 32.8 grains. See *POTASH*.

PEARL-Barley. (See *BARLEY*.) This affords, to a microscopic observer, a peculiar kind of mite worthy of attention, and very different from the common species. The bodies of these have some brown marks upon them, and have not such long hairs as the common mites have; the hinder part of the body also is of a different make. They have eight legs; and before the head there stand two weapons twice as thick as the legs, and of about half their length: these are divided towards their ends with joints like fingers, and those have at their ends a sort of nails formed with sharp and crooked claws; and one of the longest joints is serrated at the edge like a saw. These weapons serve not only as arms and hands to seize hold of things, but they also serve as a defence; for as soon as any danger threatens the creature's head, it erects them both, and makes them meet and fold into one another over the head, as we can join our hands and fingers together in the same erect posture. Phil. Trans. No. 222.

PEARL Colour, in *Glass*. This beautiful colour is given to glass in the following manner: put tartar calcined to a whiteness into purified crystal, while in fusion, at several times, in small quantities, mixing it well every time, till the glass is become of the desired colour; and when it is, work it as quick as can be, for it is a colour that is quickly gone. See *GLASS*.

PEARL Shell or Gaper. See *MYA*.

PEARL, Pin, or Web, in *Medicine*, an unnatural speck, or thick film over the eye. See *PANNUS*.

PEARL, White, is the powder of pearls, or the finer parts of oyster-shells, much used in miniature paintings. The method of preparing it is to take the oysters, as they are found on the sea-coast, calcined by the sun, or otherwise to dry fresh ones by the fire, till they may be easily powdered; to scrape off from these shells all the external or other parts that are not of the most perfect whiteness; and to levigate them well with water on the stone, and wash the powder over till it is thoroughly fine.

PEARL, White, as a cosmetic, or magistry of bismuth, see *BISMUTH*.

PEARLED CROWNS. See *CROWN*.

PEARLSTONE, so called by Jameson, and *Perlstein* of Werner, in *Mineralogy*. Its colours are pearl and smoke-grey, yellowish-grey, flesh-red, and reddish-brown, also greyish-black. It occurs in round and longish vesicles; its lustre is shining and pearly; its fracture is small, and imperfectly conchoidal. It is composed of thin concentric lamellar concretions; translucent on the edges, easily frangible.

gible and soft. According to Klaproth, it is composed of

75.25	Silex.
12.	Alumine.
1.6	Oxyd of iron.
4.5	Potash.
2.5	Lime.
2.5	Water.

98.35

It occurs in porphyry, and often contains balls of obsidian; and is found near Tokay in Hungary.

PEARL'S POINT, in *Geography*, a cape on the W. coast of the island of Antigua.

PEARSON, JOHN, in *Biography*, a learned prelate of the church of England, son of a clergyman, who was rector of Creak and Snoring, in Norfolk, was born in the year 1612 or 1613. When he was eleven years old he was sent to E'on school, from whence, in 1631 or 1632, he was elected to King's college, Cambridge. Having taken his degree, he was, in 1635, chosen a fellow of his college. In 1639 he entered into holy orders, and in the following year bishop Davenant collated him to a prebend in the church of Sarum, and about the same time he was appointed chaplain to the lord-keeper Finch, who presented him to a living in Suffolk. On the commencement of the civil wars Mr. Pearson was made chaplain to lord Goring, and attended him when he went in the king's service into the west of England. Here he preached a series of sermons, which he afterwards published in a different form, under the title of "An Exposition on the Creed, &c." It was reprinted with additions and improvements in folio, and has been so well received and highly applauded by the learned and judicious, as to have gone through at least twelve or fourteen editions. Soon after the restoration of Charles II. preferment and honours flowed in rapidly on Mr. Pearson. In 1660 he was presented to the rectory of St. Christopher's in London; created a doctor of divinity at Cambridge by a mandamus from the king; installed a prebend in the cathedral of Ely; nominated archdeacon of Surrey; and appointed master of Jesus college, in Cambridge. In the following year he was one of the assistant managers on the part of the establishment at the Savoy Conference, on which occasion he conducted himself in a manner highly reputable to his character and talents. Mr. Baxter says, that "Dr. Pearson was their true logician and disputant, without whom, as far as I could discern, we should have had nothing from them but Dr. Gunning's passionate invectives, mixed with some argumentations. He disputed accurately, soberly, and calmly, being but once in any passion, breeding in us a great respect for him, and a persuasion, that if he had been independent, he would have been for peace, and that if it were in his power, it would have gone well. He was the strength and honour of that cause, which we doubted whether he heartily maintained." In June 1661, he was appointed lady Margaret's professor of divinity at Cambridge; and he filled that chair with distinguished credit and applause. In 1662 he was elected to the mastership of Trinity college, Cambridge, which led him to resign his other preferments in the church. In 1672 he was raised to the episcopal bench, being nominated the successor of the celebrated Dr. Wilkins in the see of Chester, with which he was permitted to hold the arch deaconry of Surrey, and the rectory of Wigan, in Lancashire. He had previously to this prepared for publication a learned work, which was published in 1672, entitled "Vindiciæ Epistolæ S. Ignatii—Accefferunt Isaaci Vossii Epistolæ duæ adversus

David Blondellum." The work owed its origin to the dispute then agitating concerning episcopacy, and was intended to support the arguments in its favour drawn from the epistles attributed to Ignatius, in opposition to those who did not admit the authenticity of those epistles. On this point Dr. Pearson so far concedes to his opponents as to admit, that of the three Latin and twelve Greek epistles published in Ignatius' name, the former are spurious, and five of the latter are of doubtful authority; but he maintains the authenticity and genuineness of the seven other Greek epistles, which are mentioned by Eusebius. Dr. Pearson held the bishopric of Chester upwards of thirteen years, but was, for several of those years previously to his death, disqualified for all public service by his infirmities. He died in 1686, when he was in the seventy-fifth year of his age.

He left behind him a number of works, which were creditable to his learning and industry. He was author of a preface to the Golden Remains of the ever-memorable Mr. John Hales of Eton; of "No Necessity of Reformation of the public Doctrine of the Church of England &c." of the preface to J. Field's edition of "The Septuagint;" and of "Annales Cyprianici, five tredecim annorum, quibus S. Cyprianus inter Christianos versatus est, Historia Chronologica." He was one of the editors of the "Critici Sacri," or collection of critics and commentators upon the bible, in nine volumes folio; and from his MSS. were published, after his death, "V. Cl. Joannis Pearsoni S. T. P. Cestriensis nuper Episcopi, opera Posthuma Chronologica, &c."

Bishop Pearson was a man of profound and general learning, an exact chronologist, and intimately acquainted with the writings of the fathers and ecclesiastical history. He is described by bishop Burnet, as in all respects the greatest divine of the age, a man of great learning, strong reason, and of a clear judgment. He was a judicious and grave preacher, more instructing than affecting; and a man of a spotless life, and of an excellent character. The same worthy prelate says, that Dr. Pearson's "work on the Creed is among the best that our church has produced." But he adds, that "he was not active in his diocese; too remiss and easy in his episcopal function; and was a much better divine than a bishop." He was a melancholy instance of what a great man can fall to; for his memory went from him so entirely, that he became a child some years before he died.

PEASE, in *Botany*, &c. See PEA.

PEASE-bloom-damp, in *Natural History*. See DAMP.

PEASE-bolt, a provincial term applied to pease-haulm.

PEAT, in *Rural Economy*, a sort of earth dug out and used in many countries for fuel. It is found in moist low grounds that lie betwixt hills, especially if timber has formerly stood upon the spot. It lies at various depths, being often near the surface, and sometimes from six, eight, or ten feet, to twelve or fifteen yards deep, having a stratum of black moory earth over it, such as the soil of many of our low meadows near the banks of rivers; it sometimes lies under a bed of gravel. It is moderately compact, and capable of being cut with a sharp thin spade into solid masses, like bricks. Exposed to the air, it dries slowly, and becomes somewhat hard, and very inflammable. The best kind burns in an open grate with a yellowish-blue flame, resembling that of charcoal, and with a less quantity of smoke than wood affords. Some varieties are considerably charged with pyrites, and some also with sulphates of soda and magnesia; and they are thus deteriorated as combustibles. By digestion in boiling water, peat affords a deep brown solution, slightly bitter to the taste, and containing an uncombined vegetable acid, similar to the suberic, with a portion of extract, and a little sulphur. By dry distillation, there comes over a watery ammoniacal liquor, and empyreumatic

oil, and carburetted hydrogen; a considerable quantity of charcoal remaining in the retort.

Peat is a sort of material which is found to exist in large tracts in different parts of the kingdom, and was formerly supposed to be useless in improving the lands in its neighbourhood; but later experiments have sufficiently shewn, it is a vegetable substance that, when properly mixed with other materials and applied, is capable of affording vast advantages in different cases. It should therefore not be neglected or overlooked where the farmer has an opportunity of making use of it. Lord Dundonald has well remarked, that peat, or vegetable matter, should be carried from the peat-moss to the poor soil, and the surface mould from the poor soil to the peat moss. By these means two beneficial purposes may, at the same time, be effected. The quantity of such like or other earthy matter necessary to be added to a peat soil, to alter the mechanical arrangement of its parts, is to be ascertained by proper trials; and, on the other hand, the quantity of peat requisite to be applied to poor soils will be regulated by the quantity of vegetable matter which such soils may already contain. And, the most efficacious method of applying peat to poor barren soils, is to mix it with the urine and dung of cattle; on failure of these articles, with alkaline and other salts; and lastly, with lime. He observes that experience can only determine the number of loads or weight of these different preparations, which should be given to an acre of ground. From such experiments as have already been made with the preparations of alkaline and some other salts, there is reason to believe that the quantity necessary to be given at one time would not exceed that of a proper dunging, and that equally beneficial effects would be produced. If this, on general experience, should be proved, the peat mosses in Great Britain and Ireland will not only afford an inexhaustible supply of manure for the poor lands in their vicinity, but may themselves, by the application of alkaline and other salts, be brought to the highest state of fertility.

Peat-mosses and fens have, hitherto, generally been considered either as nuisances, when in an unimproved state, or as soils of the greatest fertility, when cultivated. These different states regard only the peat-moss or fen itself, and have no reference to any consequences that might arise by the application of peat or of any preparation of it to the neighbouring lands. But as peat has been discovered to be capable of being converted into the most valuable of all manures, the importance of the peat-mosses in Great Britain and Ireland cannot, therefore, be too much impressed on the minds of the land-owners and occupiers of these countries. It is further stated, that from experiments made with alkaline salts and peat, it can be ascertained, that the effects of such mixture, weight for weight, are equal, if not superior, to those of dung. The usual quantity of dung given to an acre of ground, when it is intended to manure it effectually, is about eighteen tons. This it may, perhaps, receive once in five years. It will require a farm to be well managed and in high cultivation, to admit of one-fifth of it to be annually so manured. He supposes, that the best cultivated land, by the return of its own manure, unless when a quantity of vegetable matter has been accumulated, cannot do more than keep itself in heart; of course, nothing can be spared for the amelioration or improvement of poor or waste lands. The rendering the inert vegetable matter of peat-mosses and fens serviceable to this purpose, though effected at a greater expence than is at present incurred by any application or dressing to ground, could not fail to answer the expectation of the farmer, and must be considered as one of the most valuable improvements that has hitherto occurred in the annals of husbandry.

It is the opinion of some that it may be laid on land in the most effectual manner, by having it mixed up or blended with lime newly slaked in the proportion of one part of the lime to five or six of the peat; but later trials lead to the conclusion that it may be used more successfully by having it incorporated with some sort of manure, such as that of dung. In this state of combination very great effects have been produced by it, as suggested above, in numerous instances where it has been employed.

States of Peaty Matter.—The earl of Dundonald states the different preparations of peat, or states of mixture, in which it may be applied to lands, with good effects in counteracting particular defects, or in rendering them generally more fertile, to be these:

“ Peat, unmixed,
 —, ditto - - - oxygenated,
 —, oxygenated, mixed with dung and urine,
 —, ditto - - - alkaline salts,
 —, ditto - - - alkaline hepar,
 —, ditto - - - Glauber salt and lime,
 —, mixed - - - newly slaked lime,
 — and lime, mixed with peat ashes.”

It is supposed that all these preparations may, according to circumstances, be used to advantage. The consuming peat to ashes by fire, is always to be considered as the least productive, and most uneconomical. The most beneficial and productive of these preparations will be found to be:

Peat with dung and urine;
 — alkaline salts;
 — alkaline hepar;
 — Glauber salt and lime: and
 — lime.

In cases where the soil does not contain a due proportion of calcareous matter, a preference should always be given to the last or the two last of the above preparations, until it shall have received a sufficient supply of an article so indispensably necessary as calcareous matter to the production of sweet herbage, leguminous plants, and grain. It is farther supposed that by the above method of mixing peat with lime in the proportion of five or six times the weight of the former to that of the latter, no injury can possibly arise from the over proportion of the lime. As the lime, when thus mixed with the peat, will meet with proper matter for it to combine with, or act upon; and the small proportion necessary to be used, when put in comparison to the weight of the peat, will be much less than the quantity of lime only, frequently applied at once to land; it is conceived that the bulk, weight, and the expence of the preparation, may direct the farmer in respect to the proportion that may be requisite to effect his purpose in most cases.

And in an ingenious pamphlet lately published by lord Meadowbank, the following directions are given for forming peat into a manure to be applied to ground.

Let the peat-moss, of which compost is to be formed, be thrown out of the pit for some weeks or months, in order to lose its redundant moisture. By this means, it is rendered the lighter to carry, and less compact and weighty, when made up with fresh dung for fermentation; and, accordingly, less dung is required for the purpose, than if the preparation is made with peat taken recently from the pit. The peat taken from near the surface, or at a considerable depth, answers equally well. Then take the peat-moss to a dry spot, convenient for constructing a dunghill to serve the field to be manured. Lay the cart-loads of it in two rows, and the dung in a row betwixt them. The dung thus lies nearly on the area of the future compost dunghill, and the rows of peat should be near enough each other, that workmen, in making

making up the compost, may be able to throw them together by the spade. In making up, let the workmen begin at one end; and at the extremity of the row of dung, (which should not extend quite so far at that end as the rows of peat on each side of it do,) let them lay a bottom of peat, six inches deep and fifteen wide, if the grounds admit of it; then throw forward, and lay on about ten inches of dung above the bottom of peat; then add from the side-rows about six inches of peat; then another thin layer of dung; and then cover it over with peat at the end where it was begun, at the two sides, and above. The compost should not be raised above four feet, or four feet and a half high; otherwise it is apt to press too heavily on the under parts, and check the fermentation. When a beginning is thus made, the workmen will proceed working backwards, and adding to the column of compost, as they are furnished with the three rows of materials directed to be laid down for them. They must take care not to tread on the compost, or render it too compact; and, of consequence, in proportion as the peat is wet, it should be made up in lumps, and not much broken. And that, in mild weather, seven cart-loads of common farm-dung, tolerably fresh made, is sufficient for twenty-one cart-loads of peat-moss: but, in cold weather, a large proportion of dung is desirable. To every twenty-eight carts of the compost, when made up, it is of use to throw on, above it, a cart-load of ashes, either made from coal, peat, or wood; or if these cannot be had, half the quantity of slaked lime may be used; the more finely powdered the better. But these additions are no-wise essential to the general success of the compost. It is farther stated that the dung to be used should either have been recently made or kept fresh by compression; as, by the treading of cattle or swine, or by carts passing over it. And if there is little or no litter in it, a smaller quantity will serve, provided any spongy vegetable matter is added at making up the compost, as fresh weeds, the rubbish of a stack-yard, potatoe-shaws, sawings of timber, &c. And as some sorts of dung, even when fresh, are much more advanced in decomposition than others, it is material to attend to this, for a much less proportion of such dung as is less advanced will serve for the compost, provided care is taken to keep the mass sufficiently open either by a mixture of the above-mentioned substances, or, if these are wanting, by adding the peat piece-meal; that is, first making it up in the usual proportion of three to one of dung; and then, after a time, adding an equal quantity, more or less, of moss or peat. The dung of this character, of greatest quality, is shamble-dung, with which, under the above precautions, six times the quantity of peat, or more, may be prepared. The same holds as to pigeon dung, and other fowl dung; and, to a certain extent also, as to that which is collected from towns, and made by animals that feed on grains, refuse of distilleries, &c. It is still further observed, that the compost, after it is made up, gets into a general heat sooner or later, according to the weather, and the condition of the dung; in summer in ten days or sooner; in winter, not perhaps for many weeks, if the cold is severe. It always, however, has been found to come on at last. In order to bring on the heat more expeditiously in a compost made up in frost, a narrow addition of dung and peat has, sometimes after the frost has gone off, been laid along the sides of the compost, scraping down a little the coating of peat upon it, and, in summer, it sometimes rises so high, as to be mischievous, by consuming the materials (fire fanging). In that season a stick should be kept in it in different parts, to pull out and feel now and then; for if it approaches to blood heat, it should either be watered, or turned over; and on such an occasion, advantage may be taken to mix it with a little fresh moss. In

June 1796, a compost was formed, only 2½ peat to one dung; it heated in July beyond the measure of a thermometer graduated to 110°. Part was allowed to stand, part turned with a half more moss. Three weeks after, (18th August), the heat of the former had descended to 84°, while that of the latter had got up again to above 110°. The heat subsides, after a time, and, with great variety, according to the weather, the dung, and the perfection of the making up of the compost; which then should be allowed to remain untouched, till within three weeks of using, when it should be turned over, upside down, and outside in, and all lumps broken; then it comes into a second heat; but soon cools, and should be taken out for use. In this state, the whole, except bits of the old decayed wood, appears a black free mass, and spreads like garden mould. Use it weight for weight, as farm-yard dung; and it will be found, in a course of cropping, fully to stand the comparison. Let it be observed that the object, in making up the compost, is to form as large a hot-bed as the quantity of dung employed admits of, and then to surround it on all sides, so as to have the whole benefit of the heat and effluvia. Peat, nearly as dry as garden-mould in feed-time, may be mixed with the dung, so as to double the volume and more of it. Workmen must begin with using layers; but, when accustomed to the just proportions, if they are furnished with peat moderately dry, and dung not lost in litter, they throw it up together as a mixed mass; and they improve in the art, so as to make a less proportion of dung serve for the preparation. The addition, recommended, of ashes or lime to the compost, is thought to favour the general perfection of the preparation, and to hasten the second heat. The lime laid on above the dung-hill, as directed, is rendered mild by the vapours that escape during the first heat. It is added that such compost as is made up before January, has hitherto been in good order for the spring crops; but this may not happen in a long frost. In summer, it is ready in eight or ten weeks; and if there is an anxiety to have it soon prepared, the addition of ashes, or of a little lime rubbish of old buildings, or of lime slaked with foul water, applied to the dung used in making it up, will quicken the process considerably. Lime has been mixed previously with the peat; but the compost prepared with that mixture, or with the simple peat, seemed to produce equally good crops. All the land, however, that it has been tried on, has been limed more or less within these twenty-five years.

It is said, farther, that the rich coarse earth, which is frequently found on the surface of peat, is too heavy to be admitted into this compost; but it makes an excellent top-dressing, if previously mixed and turned over with lime. And peat, prepared with the lime alone, has not been found to answer as a good manure. In one instance, viz. on a bit of fallow, sown with wheat, it was manifestly pernicious to the land.

In some of these modes, this substance may be rendered capable of extensive application as a manure to land. See MANURE and MOSS.

PEAT-Ashes, in *Agriculture*, the ashes that remain after the combustion of this sort of vegetable material. This is, however, a very wasteful and dissipating process, as there is seldom one-twentieth part of its weight afforded in ashes. The rest is thus forced off into the air and lost, which by other means might be saved, and contribute to the vegetation and growth of plants. Where, however, the practice of converting it into ashes is had recourse to, it is observed that the peat may be burnt all the summer season: as soon as it is dug, some of it is mixed in a heap regularly disposed with faggot-wood, or other ready burning fuel: after a layer or two of it is mixed in this manner, peat alone is piled up to compleat the heap. A heap will consist of from four hundred

dred to a thousand loads. After setting fire to it at a proper place, before on purpose prepared, it is watched in the burning, and the great art is to keep in as much of the smoke as possible, provided that as much vent is left as will feed the fire. Whenever a crack appears, out of which the smoke escapes, the labourer in that place lays on more peat; and if the fire slackens too much within, which may be easily known by the heat on the outside, the workman must run a strong pole into the heap, in as many places as is necessary to supply it with a quantity of fresh air. When managed in this manner, the work goes on as it should do. It is to be noticed that when once the fire is well kindled, the heaviest rains do it no harm whilst it is burning.

And after having procured a sufficient quantity of ashes, the farmer's next care should be to apply them properly to use; and to do this, he must be well acquainted with the nature of the manure he is to lay on his land. With respect to peat-ashes, almost the only danger proceeds from laying them on in too great quantities at improper seasons. Nothing can be better, it is asserted, than peat-ashes for dressing low damp meadows, laying on to the quantity of from fifteen to twenty Winchester bushels on an acre; it is best to sow them by hand, as they will then be more regularly spread. And this work should be done in January or February at latest, that the ashes may be washed in towards the roots of the grass by the first rains that fall in the spring. If they were spread more forward in the year, and a speedy rain should not succeed, being hot in their nature, they would be apt to burn up the grass, instead of doing it any service. In regard to the quantity, it must be remembered, that the damper and stiffer the soil, the more peat-ashes should be laid on it; but on grass-land, the quantity should never exceed thirty Winchester bushels, and on light warm lands less than half that quantity is fully sufficient.

Also, on wheat crops these ashes are of the greatest service, but they must be laid on with the utmost discretion. Were they to be spread in any quantity before the winter, after sowing the corn, they would make the wheat too rank, and do more harm than good: was the spreading of this manure, on the contrary, deferred till the spring, the corn could not possibly during the winter season be benefited by it. After due reflection and repeated experience, the method of management was as follows: About the beginning of November, before the hard frosts set in, the writer sows on every acre of his heavy clayey wheat land, about eight Winchester bushels of these ashes; on his lighter warmer lands in wheat, he sows only four bushels at this season. The winter dressing is, he imagines, of great service: trifling as the quantity may seem, it warms the roots of the plants, brings the crop moderately forward, preserves its verdure, and disposes it to get into a growing state the first fine weather after Christmas. About the latter end of February, or the beginning of March, on the above-mentioned heavy lands in wheat, he bestows another dressing of ashes, by sowing of them on every acre eight bushels more; on light lands, in the second dressing, he allows only six bushels. These ashes laid on in the spring are of the greatest service, without any probability of danger; if rain falls within a few days after the dressing is laid on, it is washed in, and has a happy effect on the succeeding crop, co-operating with the manure that was laid on in November: if, on the contrary, dry weather for a long continuance succeeds, the first winter dressing has its full effect, and the quantity laid on in the spring is in fact so small, that there is very little probability of its burning or hurting the crop. This method has succeeded very well with him, and he has no reason to think it can fail with others. It is likewise stated as an useful fact, that this excellent manure is of great use in the turnip hus-

bandry, on many accounts, particularly as it much contributes to preserve the young crop from being devoured by the fly. When the writer sows his turnips before he harrows in the seed, he has eight bushels of these ashes strewed by hand on every acre; and when the plants shew their first leaves above ground, he sows on every acre four bushels more: by this management his crops seldom fail, when at the same time some of his neighbours sow their turnip-land three or four times over. This hint deserves attention, as pared and burnt land is said to have the same effect in preserving turnip-crops from the dreadful ravages of the fly.

It is further stated, that one of the principal advantages derived from these ashes is, however, the very great service they are of to every kind of artificial pasture. Sainfoin receives great benefit from this manure, and so do clover, ray-grass, and trefoil, provided it is laid on with discretion: the proper season is about the month of February: the quantity must be regulated by the nature of the crop and soil; but, in his opinion, it ought scarcely in any instance to exceed thirty Winchester bushels. Clover, with the help of this manure, grows with great luxuriance, inasmuch that he has often had two large crops of hay from the same field in a year, and good autumn feed afterwards.

But the effect of it is most seen in tares and vetches, and on them it is he bestows most of this manure, as they will bear it, being a very succulent plant. The writer had, last summer, a crop of tare-hay that was astonishing, by the help of these ashes, being above three large loads on an acre. The field contained six acres. It was a dryish loam, and not very rich. In the beginning of February he caused ten bushels, Winchester measure, to be strewed on each acre: immediately after the first rains had washed them in, the same quantity was in like manner spread, and about the middle of March he bestowed on each acre six bushels more for the last dressing. He is fond of dividing his entire quantities, thinking his crops are thereby less exposed to the danger of being burned, and the manure is besides more gradual and lasting in its effects. His tares came on amazingly; but they ran chiefly to haulm, which was what he wished, not having any desire of saving the seed, but intending to make the crop in hay: his only fear was, that it would rot on the ground before it was in proper condition to cut; but this he luckily escaped, by the soil being tolerably dry, and by the fineness of the weather. It was so heavy in the swath, that he was obliged to pay an extraordinary price for mowing it. He thinks the luxuriance of his crop was owing entirely to the invigorating quality of the ashes, which by their salts, &c. promoted the growth of the plants even to luxuriance.

Before he well knew the great fertilizing quality of these ashes, he lost, by improper management, a fine three-acre piece of hog-pease. He laid on this field, soon after the pease came up, threecore Winchester bushels of these ashes at one dressing: this brought them forward a great pace; but at harvest, he found to his grief, he had scarcely any corn, for he had overdone it in laying on so much, and the pease were run all to haulm. Ever since this accident he has declined using them as a common dressing for his pease, and this he has been the more induced to do, as, in several little experiments he has since made, he has found it extremely difficult to apportion the several quantities which ought to be laid on various soils when sown with pease; for the quantity that has one year succeeded very well with him, has, the next, owing to the difference of seasons, on the same soil, in another part of the same field, totally disappointed him; so that, for pease, he esteems it a very critical manure, therefore to be used very cautiously. And he says that the effects of this manure will be visible at least three years, and it does not, like

like some others, leave the land in such an impoverished state when its virtues are exhausted. It is supposed that peat-ashes are not so certain a manure for barley and oats as for winter corn; for as these are quick growers, and occupy the land but a few months, this warm manure is often apt to push them forward too fast, and make them run too much to coarse straw, yielding only a lean immature grain. Oats, however, are not so apt to be damaged by it as barley.

And he adds, that peat-ashes approach, in their effects on the several crops on which they are laid, to coal-foot; but two-thirds of the quantity that is used of foot will be sufficient of the ashes, as they are, in a much stronger degree, impregnated with a vegetative power; and they are, besides, in most places, easier procured in quantities, and at a cheaper rate.

But though this sort of dressing has been found useful on different sorts of land, it has by much the best effects on those of the light chalky kind, being often uselessly applied on such as are of a wet nature. And the full quantity is usually about forty bushels to the acre, and the time of applying them in improved husbandry in the spring months, as about March or earlier. See ASHES.

PEAT-Moss, in *Rural Economy*, a term applied to the earthy material which is dug up for fuel in some districts. It is of very different qualities and properties. See Moss and PEAT.

PEATRA, in *Geography*, a town of European Turkey, in Moldavia; 16 miles S.S.W. of Niemeetz.

PEATY-EARTH, in *Agriculture*, that sort of land which is of a peaty quality, or which contains much vegetable peaty matter. It is generally considered of a good quality. See PEAT.

PEATY-Land, that sort of ground which is of a peaty nature, or which abounds in the peaty material. There are many varieties of this sort of land, some being constituted of this substance to several yards depth, while others have it only in a very superficial manner. The former are frequently denominated peat-mosses or bogs, and the latter fens. Some of the different modes of bringing peaty-lands into cultivation, have been already noticed under Moss and Moor, but others may be introduced here with propriety. According to the earl of Dundonald, the primary step towards improving land of this sort, is to take off by proper channels the great feeder of water. This is to be effected by conducting one or more principal drains through them, and by water-courses on the solid or dry land, immediately above the level of them, so that they shall not be inundated by the surface-water or springs of the surrounding higher lands, and shall afterwards only require to be freed from the water that shall fall on their superficies. This being accomplished, the intermediate parts of the bogs should be drained, partly by open and partly by covered drains; care being taken that they are not made so deep as to lay the bog too dry: by which the peat, becoming oxygenated, and thence insoluble, would be incapable of yielding food to vegetables.

By the opposite extreme, unprofitable grasses and aquatic vegetables are produced. It is therefore an object of great importance, in effecting the drainage, to preserve a full command of the water, that it may be regulated at pleasure by the operation. The practical modes of management that are necessary in those cases, are explained more fully in speaking of the nature of moss. See Moss.

It is farther observed, that should a moss or bog be so circumstanced, as to admit of its being drained through a country which might be improved by a supply of vegetable matter, it would be prudent, previously to making the great or leading drains through the adjacent country or moss, to concert measures for making a proper communica-

tion by a canal, so that the remote lands might be supplied with peat from the moss, and the moss supplied with lime, marle, clay, earth, sand, shells, and other materials, from the distant country. And that as shell-marle is frequently found under peat-mosses, they should be bored in different places, to ascertain if they possess this valuable substance; or if they contain under the moss a rich clay or limestone gravel: for, in the event of these being found at a moderate depth, the moss or bog may be improved at a much less expence, as the distant carriage of these necessary articles, and the difficulty of carting and laying them on so loose and spongy a surface, would thereby be diminished. It is also suggested that the burning a part of the upper surface may, in some cases, be requisite, to afford, when it is otherwise too difficult to be procured, a due proportion of earthy matter. Peat-ashes will, in such cases, act in making a different mechanical arrangement in the soil; but, near the sides of the bogs where surface mould is to be had, a preference should be given to it in most cases. And the alteration in the mechanical arrangement of the soil being thus effected, the next object is the application of such substances as will bring the peat, or inert vegetable matter, into action. These substances are lime and alkaline salts, which contribute in different ways to the proposed improvement. Improved peat-mosses, bogs, or reclaimed fen-lands, are the soils the most productive of luxuriant vegetation, although from this cause they do not in general yield, in this northern and humid climate, heavy and well-filled grain. Such soils should be principally dedicated to pasture, and should only be ploughed when, notwithstanding the utmost endeavours, the ground produces coarse or rank grass; but this is in a great measure, or perhaps entirely, to be prevented by the due attention to the following directions: to keeping the water in the ditches at a proper level: to stocking the ground with a due proportion of neat cattle, sheep, and horses; as the one animal will eat the grass which springs up on the dung of the other, and which otherwise would produce tufts of coarse grass: to folding of cattle on different parts of each field: to using heavy rollers: and to top-dressings of alkaline salts, and other saline substances: and also to top-dressings of lime, either by itself, or well mixed with peat or fen mould, in the manner that has been directed above.

And it is advised, that the pasture should always be eaten quite close before winter, excepting such portions of it as are intended for winter food, which likewise should be eaten close off, before the spring vegetation commences; after which time it should not be depastured until the grass be sufficiently advanced to allow of a good bite. As all plants receive nourishment two ways, by their stems and leaves, as well as by their roots, the growth of young vegetables must necessarily be much retarded, when deprived, by being constantly eaten down, of one of their sources of subsistence. And as the consolidating the soil of peat-lands is an object of the first consideration, it is obvious, both on chemical and mechanical principles, that much cropping, and the consequent exposure of fresh surfaces to the action of air, are improper; and that after a few crops are obtained, the ground should be laid down with meadow grasses and white clover, and depastured with as much stock as it will carry. By these means, not only the soil will be consolidated and compressed, and particular grasses or herbage promoted according to the cattle so depastured, but the urine and dung of the cattle, by carefully folding them, will be laid on in such quantities, as will perform rapidly and at once the effect required; whereas, if the same quantity were divided over fifty or a hundred times the surface so folded upon, its operation would scarcely be perceptible, and the application

of each year's manure so subdivided, would either be washed away, or its beneficial effects lost, before the further quantity necessary could, in a series of fifty or a hundred years, be added to it. Hence a system of under-dunging, or manuring land, may be said to be nearly equal to no dunging at all: on which account the preference, with great reason, has been given, under all circumstances, to the ancient mode of cultivating the infield lands of Scotland. Folding in a proper manner, is particularly recommended for fen-lands and peat-lands, as the immediate effect produced by urine, is that of dissolving into mucilaginous saponaceous matter the oxygenated peat. Indeed in all businesses, it is well known, that what is once well done is not to be done again. By this judicious mode of proceeding, the chemical qualities and mechanical arrangement of the soil are so altered, that, without the grossest mismanagement, it is impossible it should return again to its former unproductive state. If this be properly attended to, the pasture will never grow coarse, or require breaking up, but will continue to improve the longer it is suffered to remain in that state. There are other reasons for continuing such lands in pasture, *viz.* the difficulty, from the softness of the soil, of conveying dung from the farm-yard to the fields; and likewise the tendency such soils have, by exposure to air, to become oxygenated, and consequently incapable of yielding the food requisite for the support of vegetables. And in the mode of stocking such pastures, it is further recommended to keep the fat, the half fed cattle, and the lean or young stock, in different inclosures, as is the practice in Ireland, and where grazing is well understood in England. The fat cattle should only top the grass, the half fed should succeed those, and lastly, the lean or store cattle should follow on the same pasture, and eat the herbage close down; repeating this practice as often as the fresh growth of grass will permit its being done with propriety. It is probable that under the above circumstances, the best sort of stock is that of sheep, as eating the herbage down in a more regular and equal manner; and at the same time contributing more to the improvement of the land, without doing any injury by their treading or otherways. See Moss.

PEATY-Soil, that sort of soil which is constituted chiefly of the peaty material. See SOIL.

PEAUCIER, in *Anatomy*, a name given by Winslow in his "Treatise on the Head," and by other of the French writers, to the muscle, called by Albinus *latissimus colli*; and the others *detrahens quadratus*, and *quadratus genæ*. Santorini has called the part of this which arises from the cheek, *musculus risorius novus*; and some call the whole *platysma myoides*.

PEBBLES, CALCULI, in *Natural History*, the name of a genus of fossils, distinguished from the flints and homochroa, by their having a variety of colours. These are defined to be stones, composed of a crystalline matter, debased by earths of various kinds in the same species, and then subject to veins, clouds, and other variegations; usually formed by incrustations round a central nucleus, but sometimes the effect of a simple concretion, and veined like the agates, by the disposition which the motion of the fluid they were formed in gave their differently coloured substances.

The variety of pebbles, of England alone, is so great, that a hasty describer would be apt to make almost as many species as he saw specimens. A careful examination will teach us, however, to distinguish them into a certain number of essentially different species, to which all the rest may be referred, as accidental variations. When we find the same substances and the same colours, or those resulting from a mixture of the same, such as nature frequently

makes in a number of stones, we shall easily be able to determine that these are all of the same species, though in different appearances; and that, whether the matter be disposed in one or two, or in twenty crusts laid regularly round a central nucleus, or thrown without a nucleus into irregular lines, or finally blended into a sort of uniform mass.

These are the three states in which we are liable to find every species of pebble; for if it hath been most naturally and regularly formed by incrustation round a central nucleus, we find that ever the same in the same species, and the crusts not less regular and certain. If the whole has been more hastily formed, and has been the result only of one simple concretion, if that has happened while its different substances were all moist and thin, they have blended together and made a mixed mass of the joint colour of them all; but if they have been something harder when this has happened, and too far concreted to diffuse wholly among one another, they are found thrown together into irregular veins. These are the natural differences of all the pebbles; and having regard to these in the several variegations, all the known pebbles may be reduced to thirty-four species. Hill's Hist. of Foss. p. 512, seq.

In all the strata of pebbles there are constantly found some which are broken, and whose pieces lie very near one another; but as bodies of such hardness could not be broken without some considerable violence, their present situation seems to imply, that they have suffered that great violence in or near the places where they now lie. Besides these, there are others also found which have as plainly had pieces broken off from them, though those pieces are no where to be found; whence it seems equally plain, that whatever has been the cause of their fracture, they have been brought broken, as we find them, from some other place, or else that the pieces broken from them must at some time or other have been carried from this place to some other distant one.

Several of these broken pebbles have their edges and corners so sharp and even, that it seems evident they never can have been tossed about or removed since the breaking; and others have their sides and corners so rounded, blunted, and worn away, that they seem to have been roughly moved and rolled about among other hard bodies, and that too either with great violence, or for a very long continuance; since such hard bodies could not have been reduced to the condition we now see them in without long friction.

It may be supposed by some that these stones never were broken, but have been naturally formed of this shape; but it will be easily seen, by any one who accurately surveys their veins or coats, which surround the nucleus like the annular circles of a tree, that they must have been originally entire; and this will be the more plain if they are compared with a stone broken by art. Such pebbles as are found in strata, that lie near the surface of the earth, are much more brittle than those which lie in deeper strata.

The more clear and transparent the sand is which is found among pebbles, the more beautiful the pebbles are generally observed to be.

The use of these stones, and their disposition in the earth, is a subject of great admiration; and may serve as one of the numerous proofs of an over-ruling Providence in the disposition of all natural bodies. The surface of the earth is composed of vegetable mould, made up of different earth mixed with the putrid remains of animal and vegetable bodies; and is of the proper texture and compages for conducting the moisture to the roots of trees and plants: and under this are laid the sands and pebbles which

which serve as a sort of drain to carry off the redundant moisture deeper into the earth, where it may be ready to supply the place of what is constantly rising in exhalations; and lest the strata of sand should be too thick, it is common to find thin ones of clay between, which serve to put a stop to the descent of the moisture, and keep it from passing off too soon; and lest these thin strata of clay should yield and give way, and by their softness when wetted, give leave to the particles of sand to blend themselves with, and even force their way through them, there are found in many places thin coats of a poor iron ore, placed regularly above and below the clay; and by that means not only strengthening and supporting the clay, but effectually keeping the sand from making its way into it. Phil. Trans. N^o 483.

PEBBLES, Ridged. It is not uncommon to meet with pebbles in our gravel-pits, which have one or more ridges, or white lines, standing above the surface of the rest of the stone, in the form of a rib or zone, laid on the stone after its formation. This, however, is not the case; but the line or zone always goes through the whole body of the pebble: the matter forming this ridge is always harder than the rest of the stone; and it seems probable, that at first it was not elevated, but level with the rest of the surface; but being not so easily worn away by accidents, and when the whole pebble came in the way of rubbing among harder bodies, this would be less rubbed away, and consequently would be left more elevated than the rest. We daily see on the sea-shores numbers of stones rounded by the continual rolling and tossing among the waves, and in these the softer parts have given way first and been worn into holes, while the harder have been left prominent. It seems probably to have been the case with these pebbles also; but they are not found on the shores; but in our gravel-pits, at a great distance from the sea: and it is evident, that these have had their surfaces thus ground and worn down between the time of their being formed by concretion, and their being deposited where we now find them. The smoothness of the surfaces of some pebbles and flints, which we find with their natural coats or crusts worn off, is another proof of the same thing. These pebbles, in this unnatural naked state, as well as the ribbed and lined ones, are found in our pits, under the strata of earth; and yet they are exactly in the same condition with those which have been tossed about and rounded on the sea-shores.

PEBBLES, Swallowing of.—There are many people of opinion, that the swallowing of pebbles is very beneficial to health, in helping the stomach to digest its food, and a pebble-posslet is an old woman's medicine in the colic, in many parts of England. They usually order the small white stones to be picked out of gravel-walks for this purpose, and eat them in large quantities in some sorts of spoon meat, of which milk is an ingredient.

The thing that has given occasion to this practice seems to have been, that people observe the birds to pick up the gravel, and that they are never well unless they have frequent recourse to this to help their digestion: but this is no similar case at all, for the gizzard or stomach of a bird is made very strong, because the creature hath no teeth to chew its food; and this gizzard is lined with a rough coat, by the help of which and these stones, the food they swallow whole is so ground, as to yield its juices to the nourishment of the animal. But the stomach of man is formed so very differently, that it can never require those assistances to the comminution of food. Many people have, however, accustomed themselves to swallow not only these small white stones, but large pebbles, even to the size of a walnut each: these will often pass safely, and people who have long accustomed themselves to swallow them, boast of receiving

no injury from them: we can never know, however, that the death of such persons is not owing to them at last; and as they can do no good, it is best always to avoid them. There is one instance on record, of much mischief done by them, in our Philosophical Transactions, N^o 253. p. 190.

PEBBLE, Egyptian, constitutes the second family of the Siliceous genus in the mineralogical arrangement of Kirwan. This stone presents various colours together in the same specimen, either in regular or irregular concentric and alternating stripes or layers, or in dots and dendritical figures. The most usual colours are the yellowish and liver-brown, reddish-brown, isabella yellow, yellowish-grey, greyish, or reddish-white, milk-white, leek-green, and black, which last is only in dots and dendritical figures. It is found in spheroidal, or flat rounded masses, which are enveloped in a coarse rough crust. Its internal lustre, 1; external, 0; its transparency, 0; its fracture conchoidal; its hardness, 10; its sp. gr. 2.564, Brisson. Found principally in Egypt, sometimes in Europe, particularly in Lorraine. Kirwan's *El. of Mineralogy*, vol. i.

PECAQUE, ST., in *Geography*, a town of Mexico, in the province of Xalisco; 45 miles N. of Compostella. N. lat. 22°. W. long. 101° 30'.

PECARI, or TAJACU, in *Zoology*. See *Sus Tajassu*.

PECCANT, in *Medicine*, an obsolete term, which was much used by the humoral pathologists to denote every sort of morbid condition of the humours of the body, to which alone they ascribed almost all diseases. Hence their principal efforts were directed to the correction of the peccant matter, or to its evacuation. See *HUMORAL Pathology*.

PECETA, in *Commerce*, a Spanish silver coin. In 1772 the peccetas and reals were reduced to 9½ dineros fine: the mark being divided into 12 dineros, and the dinero into 24 grains. The old Mexican peceta of two Mexican reals (1736) is by the assay worse than the English standard, 4½ dwt.; its weight is 4 dwt. 7¼ gr.; its content in pure silver grains 93.6; and its value 1s. 1d. sterling. The peceta of two reals of plate (1721) is worse 1 oz. 7 dwt.; its weight 3 dwt. 16½ gr.; its content in pure silver grains 71.9; and its value 10d. sterling. The Mexican peceta (1774) worse 8 dwt.; its weight 4 dwt. 7½ gr.; its content 92.3; and value 1s. 0¾d. sterling. The peceta provincial of two reals of new plate (1775) worse 1 oz. 9½ dwt.; weight 3 dwt. 18 gr.; content 72.2; and value 10d. sterling.

PECETO, in *Geography*, a town of France, in the department of the Po; 3 miles S.W. of Chieri.

PECHANTRE, NICHOLAS DE, in *Biography*, a French poet, was born at Toulouse in 1638. He gained the poetical prize from the academy des Jeux Floraux three times. His tragedy of Geta was performed at Paris in 1687, with great applause. This was followed by Jugurtha, the Death of Nero, and some others. Pechantre died in the year 1708. Moreri.

PECHAREE, in *Geography*, a town of Hindoostan, in the circar of Chandaree; 35 miles W.S.W. of Chandaree.

PECHBLENDE, in *Mineralogy*. See *URANIUM*.

PE-CHE-LEE, in *Geography*. See *PE-TCHELI*.

PECHEM, in the *Materia Medica*, a name given by the modern Greek writers to the root called *behem* by Avicenna and Serapion. Many have been at a loss to know what this root pechem was; but the virtues ascribed to it are the same with those of the *behem* of the Arabians; its description the same, and the division of it into white and red, is also the same as that of the *behem*. Nay, the word pechem is only formed of *behem*, by changing the *b* into a *p*, which is very common,

common, and the aspirate into χ , or *ch*, which is as common.

Myrepsus, who treats of this root, says the same thing that the Arabian Avicenna says of *behem*, namely, that it was the fragments of a woody root, much corrugated and wrinkled on the surface, which was owing to its being so moist whilst fresh, that it always shrunk greatly in the drying.

PECHIA, in *Geography*, a town of Servia, on the Drino; 35 miles N.E. of Ragufa. N. lat. $43^{\circ} 14'$. E. long. $19^{\circ} 15'$.

PECHLARN, or POCHLARN, a town of Austria, on the right bank of the Danube. The river is very wide, and here the Romans had a harbour for their navy. They called it "Præclara," and it was considered as one of the strongest places in the country. It was formerly the residence of the margraaves of Austria. It was given by the emperor Otho to the bishop of Ratibon; 45 miles W. of Vienna. N. lat. $48^{\circ} 14'$. E. long. $15^{\circ} 20'$.

PECHLIN, JOHN NICHOLAS, in *Biography*, an ingenious physician, was born at Leyden in the year 1646. He was educated exclusively in his native city, until he received the degree of doctor in 1667; after which he travelled into Italy, and visited the principal universities of that country. He did not remain long without an opportunity of communicating the extensive knowledge which he had obtained; for in 1673 he was appointed to a professorship at Kiel, in Holstein, where he soon attained a high reputation. In 1678 he was elected a member of the academy "Naturæ Curiosorum;" and in 1691, a fellow of the Royal Society of London. He gained the favour and patronage of the court, and in 1680 was appointed first physician to the duke of Holstein-Gottorp, and subsequently his librarian and counsellor. In 1698 he accompanied that prince in a journey to Stockholm; and again, in 1704, he visited that capital with the hereditary prince, to whom he was appointed tutor, and died there in February, 1706.

Pechlin was author of several works, some of which evince a great degree of good taste and eloquence of style, especially his essay, entitled "Metamorphosis Æsculapii et Apollinis Pancreatici;" which was a satire against Sylvius de la Boë and De Graaf, and was published under the fictitious name of Janus Leonicerius Veronensis. His other tracts were entitled "De Purgantium Medicamentorum Facultatibus," Leyden, 1672; "De Vulneribus Sclopetorum," Kiel, 1764; "De Aëris et Alimenti Defectu, et Vitâ sub Aquis," *ibid.* 1676; "De Habitu et Colore Æthiopum," *ibid.* 1677. The feat of the colour of Negroes he pointed out in the *rete mucosum*, and imagined it was occasioned by bile. "Theophilus Bibaculus, sive de Potu Theæ," Francfort, 1684, a poetical eulogium on the virtues of tea; and "Observationum Physico-Medicarum Libri tres," Hamburg, 1691,—a collection containing some curious cases, but also evincing a considerable share of credulity in the author. Eloy Dict. Hist. de la Med.

PECHMEJA, JOHN, a French writer, was born at Villa Franca in 1741. He became professor of elocution in the college of La Flèche, and died in 1785. His eulogy on the celebrated Colbert was crowned with the approbation of the academy in 1773; but he is principally known by a work in poetic prose, called "Telephe," 2 vols.

PECHOR, in *Geography*, a town of Hindooistan, in the circar of Gohud; 25 miles S.S.E. of Gwalior.

PECHOWLY, a town of Hindooistan, in the circar of Chandaree; 40 miles N.W. of Chandaree.

PECHSTEIN, in *Mineralogy*. See PITCHSTONE.

PECHYAGRA, in *Medicine*, a name given by authors to the gout affecting the elbow.

PECHYS, a name used by some anatomical writers for the elbow.

PECHYTYRBE, an epithet used by some medical writers for the scurvy.

PECK, a measure, or vessel used in measuring grain, pulse, and the like dry substances.

The standard, or Winchester peck, contains two gallons; each gallon of corn measuring 268 $\frac{2}{3}$ cubic inches, and weighing about eight pounds troy.

Four pecks make a bushel; four bushels a comb, coom, or carnock.

Besides the general, or Winchester pecks, there are local pecks, containing some more, some less; as the Lancaster peck, containing six gallons, &c. See MEASURE and WEIGHT.

PECK, FRANCIS, in *Biography*, was born at Stamford, in Lincolnshire. He was educated at Cambridge, where he took his degree of M.A. He entered holy orders, and became curate of King's Clifton, in Northamptonshire; after which he obtained the rectory of Godeby, in Leicestershire, which was the only preferment he ever obtained. In 1721 he published proposals for printing the history and antiquities of his native town; and in 1727 he published the work, entitled "Academia tertia Anglicana. or the Antiquarian Annals of Stamford, in Lincoln, Rutland, and Northampton-shires." His inquiries relative to this single object led him to extend his researches; and in 1729 he printed a sheet of "Queries concerning the Natural History and Antiquities of Leicestershire and Rutland." Though he made considerable progress in collecting materials for a work on those subjects, it never made its appearance. In 1732 he published the first volume of his "Desiderata Curiosa," or collection of divers scarce and curious pieces, relating chiefly to matters of English history; consisting of choice tracts, memoirs, letters, wills, epitaphs, &c. A second volume followed in 1735, and the whole was reprinted in one volume, quarto, in 1779. In the year 1735 he displayed his industry in "A complete Catalogue of all the Discourses written both for and against Popery, in the Time of King James II.;" and in 1739 he edited nineteen letters of Dr. Henry Hammond. In the following year he published two volumes, quarto; one entitled "Memoirs of the Life and Actions of Oliver Cromwell, as delivered in three Panegyrics of him written in the Latin Language; with a Collection of divers curious historical Pieces, relating to Oliver Cromwell, and a great Number of other remarkable Persons." The other was entitled "New Memoirs of the Life and poetical Works of Mr. John Milton," with critical illustrations. This was the last of his publications. He died in 1743, leaving behind him materials for nine different works, which he had in contemplation. Of his MSS. the greater part came into the possession of sir Thomas Cove, of which the most valuable were five volumes, quarto, written fairly for the press, entitled "Monasticon Anglicanum; Supplementis novis adauctum." These were presented to the British Museum in 1779.

PECKELSHEIM, in *Geography*, a town of Westphalia, in the bishopric of Paderborn; 15 miles S.E. of Paderborn. N. lat. $51^{\circ} 34'$. E. long. $9^{\circ} 15'$.

PECKHAM, a hamlet in the parish of Camberwell, hundred of Brixton, and county of Surrey, England, is situated on the road from London to Greenwich, at the distance of $4\frac{1}{2}$ miles from St. Paul's cathedral. In Domesday book the manor is mentioned as belonging to Battersea, and being the property of Odo, bishop of Baienx, half-brother to the Conqueror. At a later period it appears to have been divided into two manors, called Bredinghurst and

Bafynges,

Basynges, from persons of that name who possessed them, in the reigns of king John and Edward I. The manor of Bredinghurst is now vested in the widow of William Shard, esq.; but the manor-house has been lately demolished, and the site let on building-leases. At Peckham are meeting-houses for the Anabaptists and Presbyterians. Here is annually held a large show fair, similar to that of St. Bartholomew in Smithfield, London.

The parish of *Camberwell* having been inadvertently omitted in its proper place, we deem it advisable to state a few particulars under this head. It is bounded by the parish of Newington-Butts, St. George's Southwark, and Rotherhithe, on the east; by Deptford and Beekenhurst, in Kent, on the south; by Croydon, and a detached part of Battersea, on the west; and by Lambeth on the north. At the time of the Domesday survey it comprehended one manor only, which was held of the Conqueror by Haimo, the sheriff; but it was soon afterwards divided, and eventually became several distinct manors, called Camberwell-Buckingham, Milkwell Camberwell-Ferne or Fryen, Dowdale or Uredale, and Deptford Strond. There were also two inferior manors, Camberwell and Cold-Abbey, both of them held of Camberwell-Buckingham. The land in this parish is mostly possessed of great fertility, and, exclusive of the sites of the houses, is laid out "in nearly an equal proportion between arable, pasture, and gardens."

Camberwell village is distant about three miles and a quarter from St. Paul's cathedral in London. The church here was erected about the commencement of the reign of Henry VIII., and consists of a nave, chancel, and two aisles, with a small embattled tower at the west end; the whole composed of flints and rough stone, except the south-west part, which is of brick. The chancel is of a very singular shape, being the section of a hexagon. In the east window of the north aisle are several full-length figures painted upon glass. These are now much mutilated, as well as the inscription beneath, which, however, is sufficiently entire to inform us, that they were intended to represent some members of the Muscamp family, who had their burying-place in this aisle. There are, besides, in the same window, two imperfect representations of female saints. This church contains many monuments of the Scotts, Bowyers, and others who have been interred within its walls. In the parish register here are several very curious entries: one of which records an instance of a woman bearing a child at the age of sixty-three.

In this parish are several charity-schools, which are supported chiefly by subscription, except the free grammar-school. This was founded and endowed by the Rev. Edward Wilson, in the reign of James I., and now affords education to twelve boys. But the chief charitable foundation of which it has to boast is Dulwich-College, situated in the hamlet whence it derives its name. Camberwell parish contains, according to the population returns of 1811, 2060 houses, and 11,309 inhabitants. See DULWICH. Lyfons's Environs of London.

PECORA, in the Linnæan system of *Zoology*, a term, comprehending a whole order of quadrupeds, in the class of mammalia. The characters of this order are, that the creatures have no fore-teeth in the upper jaw; the lower jaw has six or eight fore-teeth, which are placed at a considerable distance from the molars or grinders. The paps of this order of animals are situated in the groin, and their feet have hoofs. Of this order Linnæus enumerates eight genera; the *camel*, *moschus*, *cervus* or *stag*, the *camelopardalis*,

the *antilope*, the *capra* or *goat*, the *ovis* or *sheep*, and *bos* or *ox*.

PECQUET, JOHN, in *Biography*, a distinguished anatomist, was a native of Dieppe, and a graduate of the university of Montpellier. He was endowed with an active and intelligent mind, and pursued the study of anatomy with great ardour and ingenuity, which he evinced by the discovery of the thoracic duct and the receptaculum chyli, in 1647, while yet a student; by which the hitherto imperfectly known system of the lacteals was completed. After this happy indication of his skill, he settled, with a view to practise his profession, in his native town; but soon afterwards going to Paris, he recommenced his anatomical researches, for the purpose of demonstrating completely the important vessels which he had discovered; and he became acquainted with the most able anatomists in that metropolis. He succeeded completely in this demonstration, and traced the progress of the chyle, which is taken up from the intestines, by the lacteal vessels, into his receptacle, and by the thoracic duct to the left subclavian vein. This discovery soon gave his name a celebrity throughout Europe; and, as has generally happened in cases of important discoveries, it was doubted and denied by some, while others contended that it was not new. The work in which he published the discovery was entitled "Experimenta nova Anatomica, quibus incognitum hactenus Chyli Receptaculum, et ab eo per Thoracem in Ramos usque subclavios Vasa lactea deleguntur;" to which was subjoined a dissertation, "De Circulatione Sanguinis et Chyli Motu," 1651. It was reprinted in 1654, together with an essay "De Thoracis lacteis," in answer to Riolan; and many subsequent editions have appeared. Pecquet was a man of considerable acquirements, in addition to his anatomical skill, and was a member of the Royal Academy of Sciences from the year 1666. He is said, however, to have shortened his days by an unfortunate attachment to the use of spirituous liquors. He died at Paris in February, 1674. Eloy Dict. Hist. de la Med.

PECQUET, ANTHONY, a French writer, was born in 1704. He attained the rank of grand master of the water-works and forests of Rouen, and superintendent of the military school. The works by which he is principally known are "An Analysis of the Spirit of Laws, and the Spirit of Political Maxims," 3 vols.; "The Forest Laws of France," 2 vols.; "Thoughts on Man." He also translated the Pastor Fido of Guarini, and other Italian works into French. He died in 1762.

PECQUETI RECEPTACULUM, in *Anatomy*, a dilated portion just at the beginning of the thoracic duct, discovered by Pecquet. (See ABSORBENTS.) It is often called receptaculum chyli.

PECTEN *of the Pubes*, the prominent ridge of the os innominatum, situated over the foramen ovale, and giving origin to the pectinalis muscle. See EXTREMITIES.

PECTEN, in *Natural History*, the name of a tribe of shell-fish, the characters of which are these: it is a bivalve shell, shutting close in all parts, of a flattened shape, striated in the manner of a comb, and often auriculated, sometimes only semi-auriculated, and in some species not auriculated at all. There are also some few species which are elate, not flat, as the others, classed in the Linnæan system with the *ostrea*; which see. See also CONCHOLOGY (*Ostrea*).

This tribe of shells has had its name, pecten, from the longitudinal striæ with which its surface is covered, which resemble the teeth of a comb. According to the general character of this shell, it will be easy to perceive that it is

meant to include the cockles as well as the scollops; these being the pectens without ears, and with lefs flat or elated shells. These are called by all authors by a name which is only diminutive of pecten, *pedunculus*. And though the having ears is the common mark of distinction between the pectens and the cockles, which last usually have none, yet the genera are not distinct, as some have supposed; for there are shells allowed to be pectens, or scollops, which have yet no ears, and others universally allowed to be pectuncles, or cockles, which have ears. Hence appears the error of Lister, who made these two distinct genera, and gave the ears and the equal convexity of both shells as the great characters of them: these, though good marks to distinguish the species by, are by no means unalterable enough to found different genera upon.

The genus of pectuncles, or cockles, has been made by all authors a very extensive one, but the reader will find all the supposed species of it very aptly received into the genus of the *cardiformis*, or heart-shell, (see *CORDIUM*.) and the pectens.

According to this establishment of the genus of the pecten, the species are to be enumerated under several distinct heads.

Thus, some pectens are auriculated on both sides: of these we have seventeen species.

Of those pectens which are semi-auriculated, we have five species.

Of those pectens which have no ears at all, we have seven species.

This shell-fish is one of the spinners of the sea, having power of spinning or forming threads like the muscle; but they are much shorter and coarser even than those of that fish, so that they can never be wrought into any sort of work, in the manner of the longer and finer threads of the *pinna marina*. The use of these threads, which the pecten or scollop spins, is to fix the creature to any other body that is near, whether it be a stone, a piece of coral, or another shell. All these threads proceed, as in the muscle, from one common trunk; they make their way out of the shell in those pectens which have only one ear, a little below that ear; in the others, probably they issue out on both sides. It is an evident proof, that the fish has a power of fixing itself at pleasure, to any solid body, by means of these threads, that after storms the scollops are often found tossed upon rocks, where there were none the day before; and yet these are fixed by their threads, as well as those which had remained ever so long in their place. They form their threads in the very same manner with the muscle, only their organ which serves for spinning is shorter, and has a wider hollow, whence the threads are necessarily thicker and shorter. See *MUSCLE*.

PECTEN Veneris, in *Botany*, Venus' Comb, so called because the long parallel beaks of the seeds assume something of the aspect of a long-toothed comb. See *SCANDIX*.

PECTINALIS, or *PECTINEUS*, (le peigné, le pubo-fémoral,) in *Anatomy*, a muscle of the thigh, placed at the upper and front part of the limb, and extending from the horizontal portion of the pubes to the upper part of the linea aspera of the femur. It is flattened, elongated, and measures about three finger-breadths above, rather less below. The fascia lata and the crural vessels cover its anterior surface above, the sartorius lower down. It covers the pubes, the hip joint, the obturator externus, the obturator vessels and nerve, and the second head of the triceps. Its inner edge is parallel to the outer margin of the first head of the triceps, by which it is a little covered; the outer edge is

parallel to the psoas magnus. Its upper extremity is fixed to the upper and posterior edge of the pubes, chiefly by fleshy fibres, from the spine or tuberosity of that bone, to the beginning of the linea ileopectinea: thence it descends obliquely outwards and backwards, and, arriving opposite to the little trochanter, is twisted on itself, so that the anterior surface is turned outwards, the posterior inwards: it is then inserted in the line, which descends from the basis of the little trochanter to the beginning of the linea aspera.

The lower part of the pectinalis consists of a flattened tendon, extending upwards on the front of the muscle. The fleshy fibres arise from the pubes by very short aponeuroses, and terminate on the back of the tendon.

It bends the thigh on the pelvis, or *vice versa*: it contributes to maintain the pelvis in equilibrio on the lower limbs, when we stand. It will draw the thigh inwards, or towards the opposite limb, and carry it across the other. It rotates the thigh-bone outwards.

PECTINATI MUSCULI, the muscular fibres of the right auricle of the heart, so called because they are arranged in parallel fasciculi, somewhat resembling the teeth of a comb. See *HEART*.

PECTINATION, *Combing of the Head*. Frequent pectination is recommended by many physicians to women, and men who wear their hair, as an exercise; and, at the same time, a kind of friction.

PECTINATUM FOLIUM, in *Botany*, a simple leaf, whose numerous, deep, parallel segments, resemble the teeth of a comb. See *LEAF*.

PECTIS, might be so called perhaps, as professor Martyn says, from πᾶσις, *neatly combed or trimmed*. From looking at the original specimen of *P. ciliaris*, we are disposed to think that Linnaeus, the author of the name, had more particularly in his mind the idea of *pecten*, a comb, as applicable to the fringed bases of the leaves.—Linn. Gen. 430. Schreb. 564. Willd. Sp. Pl. v. 3. 2130. Mart. Mill. Dict. v. 3. Juss. 182. Lamarck Illustr. t. 684. Gært. t. 171. Class and order, *Syngenesia Polygamia-superflua*. Nat. Ord. *Compositae oppositifoliae*, Linn. *Corymbiferae*, Juss.

Gen. Ch. *Common calyx* cylindrical, of five oblong, obtuse, nearly equal leaves. *Cor.* compound, radiated; perfect florets about six, rarely fewer or more, in the disk, funnel-shaped, equally five-cleft; female ones in the radius five, rarely fewer, ligulate, ovate, rather longer than the calyx. *Stam.* in the perfect florets, filaments five, short; anthers united into a cylindrical tube. *Pist.* in the perfect florets, germen linear; style thread-shaped; stigma cloven; in the female, germen linear; style thread-shaped; stigmas two, revolute. *Peric.* none, except the unchanged spreading calyx. *Seeds*, in all the florets, solitary, linear. Down of three or five chaffy bristles, various in length and breadth. *Recept.* naked.

Eff. Ch. Receptacle naked. Seed-down of various chaffy bristles. Calyx of five leaves, cylindrical. Florets of the radius five.

1. *P. humifusa*. Swartz Ind. Occ. v. 3. 1362. Willd. n. 1. (*Jacobaea humifusa*, *hyperici foliis*; Plum. Ic. 84. t. 95. f. 2.)—Leaves spatulate, obtuse, fringed at the base. Flowers stalked. Calyx-leaves elliptical. Stem procumbent.—Native of various islands in the West Indies, in open barren spots, communicated by Dr. Swartz. *Root* annual, tapering, with many fibres. *Stems* herbaceous, procumbent, three or four inches long, much branched, square, smooth, leafy. *Leaves* crowded, opposite, each pair crossing the others, sessile, about half an inch long, spreading, spatulate, obtuse, entire, thickened, and sometimes roughish, at the

the edge, tipped with a very minute point; their under side paler, besprinkled with glandular dots; the base linear, elongated, clasping the stem, fringed with four or five bristly coarse teeth at each side. *Flowers* scarcely more than one on each branch, towards the extremity, axillary, on a simple, naked, sometimes downy, stalk, half an inch or more in length. *Calyx-leaves* elliptical, folding over each other, hardly half an inch long, strongly keeled, obscurely dotted, obtuse, emarginate, and minutely downy at the summit. *Florets* yellowish; those of the disk, according to Swartz, ten, rather unequally five-cleft; those of the radius five, short, oblong, entire. *Seeds* all linear-oblong, angular, black, those of the disk often abortive. *Down* of five chaffy bristles, lacinated at the base, ferrated at the edge.

2. *P. prostrata*. Cav. Ic. v. 4. t. 324. Willd. n. 2. —Leaves oblong, fringed at the base. Flowers sessile. Calyx-leaves elliptic-oblong. Stem procumbent.—Native of New Spain. It flowered at Madrid in the autumn of 1795. This seems, as Willdenow remarks, very near the former, from which it differs in having longer leaves, but especially in the want of stalks to the flowers, which are quite sessile, either at the ends of the branches, or in the fork between them. The calyx-leaves moreover appear to be much narrower, and scarcely folding over each other, but we have only Cavanilles's plate to judge by. *Down* of five awl-shaped chaffy scales. The leaves are an inch or more in length; glaucous and dotted, as in the foregoing, underneath.

3. *P. ciliaris*. Linn. Sp. Pl. 1250. Am. Acad. v. 5. 407. (Jacobæa foliis falcis, ad margines villosis; Plum. Ic. 145. t. 151. f. 2?)—Leaves linear-lanceolate; tapering, and strongly fringed, at the base. Flowers axillary, sessile. Stem erect.—Native of Jamaica. *Browne* in *Herb. Linn.* *Root* annual. *Stem* erect, hardly a span high, divided, or slightly branched, leafy for the most part, obscurely marked with a narrow, downy, intrafoliaceous line at each side. *Leaves* opposite, clasping the stem, above an inch long, linear, or somewhat lanceolate, obtuse with a small point; smooth on both sides; copiously and irregularly dotted, but not glaucous, beneath; entire, but rough at the edge with minute teeth; tapering at the base, and fringed in that part, usually for the space of half an inch, with numerous, distant, coarse, long, tawny, bristly hairs, directed upwards in a parallel manner. We can find no flowers on either of Browne's two specimens, but in the *Amœn. Acad.* they are described as "axillary and sessile; the corolla yellow and small; the seeds of the disk crowned with five bristles, membranous at the base, those of the radius with two only." Such are all the particulars which we can positively ascertain respecting this plant, whose history is remarkably confused, especially in Willdenow. The only synonym cited by Linnaeus in *Sp. Pl.* is Plumier's, which we dare not admit without a query. Its greater size may be no objection, but the fringe of the leaves extends much too far, and there is a representation of a short external calyx to one flower, which cannot agree with any *Pectis*. The latter may be an error of the copier or engraver. We see no other exception to make, but on the contrary the shape and situation of the flowers answer perfectly to the above description, which cannot have been made from this plate, because the colour of the corolla, and structure of the seed-down, could not have been learned from thence. But what can be the *P. ciliaris* of Swartz's *Obf. 307*? He describes the stem and branches as diffuse, the leaves perforated, as it were, at the margin; the flowers stalked, solitary, either in the summits or forks of the branches. He says his plant inhabits barren places in Hispaniola, flowering in June, and the leaves are

eaten fresh with bread, having a sweet smell like livery. He quotes *Hieracium minimum*, longis integris et angustis foliis; Sloane *Jam. v. 1. 255*; by mistake changing *angustis* to *argenteis*, and omitting the figure, which is t. 150. f. 1. Willdenow copies him implicitly of course. Now this figure, though bad, is not unlike our first species, with which however Swartz's description will not agree, nor do we know any plant that exactly answers to it. The leaves in Plumier's t. 86. f. 1. come the nearest as to the dots. See *P. punctata*.

4. *P. linifolia*. Linn. Sp. Pl. 1250. Am. Acad. v. 5. 407. (*P. punctata*; Jacq. *Amer.* 216. t. 128. Swartz *Obf.* 308. *Tagetes*? minor, caule subdiviso diffuso, foliis linearibus integris; Browne *Jam.* 319. *Hieracium* fruticosum, angustissimis gramineis foliis, capitulis parvis; Sloane *Jam. v. 1. 255. t. 149. f. 3*, very imperfect.)—Leaves linear, acute, with two or four setaceous teeth at the base. Stem forked, many-flowered. Seed-down of a few spreading awl-shaped bristles.—Native of Jamaica, Hispaniola, and Carthage, flowering from June to October. The root is annual. *Stem* two or three feet high, much branched and repeatedly forked, erect according to Jacquin, but diffuse according to Browne; the branches angular and smooth. *Leaves* about an inch and a half long, linear and very narrow, tapering at each end, entire, somewhat revolute when dry, smooth, besprinkled with dots beneath, even in Browne's own specimen which is described in *Am. Acad.*, though they are there said to be *levia*, (as opposed to dotted,) nor are the dots wanting in two other specimens now before us. Jacquin's figure however represents them rather too minute and copious. At the base of the leaf, on each side, is one or two pair of spreading, bristle-shaped teeth. *Flower-stalks* numerous, solitary from the forks of the stem, single-flowered, half an inch long, slender, angular, smooth, often bearing one or two setaceous bristles. *Flowers* small, yellow, with more or less of a purple tinge; florets of the disk three, rarely but two, their seed crowned with two spreading, smooth, awl-shaped bristles, about the length of their own corolla; those of the radius five, with three similar bristles to their seed. In these respects all our specimens answer to the Linnaean description; as also to that of Jacquin, so that there can be no doubt of his plant, though we are obliged to prefer the Linnaean specific name, of nearly the same date.

5. *P. punctata*. Linn. Sp. Pl. 1250, excluding Jacquin's synonym. (*P. ciliaris*; Swartz *Obf.* 307? *Chondrilla* foliis angustis et ad oras punctatis; Plum. Ic. 74. t. 86. f. 1.)—Leaves oblong, acute, with two or four minute bristles at the base. Stem forked, many-flowered. Seed-down of several short lacerated scales.—Native of the West Indies. We have specimens in the herbarium of the younger Linnaeus, marked *P. patula*, apparently a manuscript name, every body having considered the foregoing as the Linnaean *punctata*. But that being certainly *linifolia*, and the synonym of Plumier answering well to the present, even in the parts of fructification, though the dots of the leaves are rather too marginal and regular, we retain for it the name of *punctata*; an appellation by no means discriminative indeed, as every known species is dotted. The size and habit of the plant are like the last; the stem angular, purplish, repeatedly forked, and finally somewhat panicled. The leaves however are scarcely more than half as long, and nearly twice as broad, strongly dotted beneath, frequently rough-edged; their base furnished with one or two pair of extremely small bristles, not half the size of what are observable in *linifolia*. *Flower-stalks* much the same, but with more numerous, smaller, more chaffy bristles. *Florets* of the disk about six; those of the radius five. *Seed-down* in each of from three to

five small, chaffy, fringed and jagged, brown scales, smallest, and perhaps fewest, in the marginal florets. In three instances we find one of these scales, in the disk, elongated into a hispid bristle, extending rather beyond the *corolla*; a conclusive proof of the variableness of the *seed-down* in *Pectis*, which is notwithstanding a most natural genus. Is it possible that this species can be *P. ciliaris* of Swartz? Perhaps the bristles of the *seeds* may be sometimes more numerous than we have found them, and then his otherwise unintelligible description of the *sete* and *pappus* will be accounted for. We cannot ascertain what this author intends by *P. linifolia*, for which he has merely a reference to Petiver, (*Rapunculus Jamaicensis, folio tenuiflora*.) without page or plate, a citation we are unable to verify. That reference may belong to the real *linifolia*, though the latter should seem to be Swartz's *punctata*.

6. *P. pinnata*. Lamarck Journ. d'Hist. Nat. v. 2. 150. t. 31. Cav. Leccion. 203. (Schkubria abrotanoides; Roth. Catal. v. 1. 117. v. 2. 116. Willd. Sp. Pl. v. 3. 2130.)—Leaves deeply pinnatifid, thread-shaped. Stem panicled. Seed-down of several jagged scales, as long as the florets.—Frequent in New Spain. It has been cultivated for twenty-five years past in the gardens of Spain and France. We obtained it in 1792, from that of Dr. Bellardi at Turin, by the name of *P. trifida*. Roth says the *root* is annual, which we believe to be the case; Lamarck makes it perennial. Stem erect, two feet high, leafy, angular, deeply furrowed, smooth, alternately branched, panicled, many-flowered. Leaves alternate, pinnatifid, a most capillary and obtuse, like some of the finer kinds of *Artemisia*, one inch and a half or two inches long, smooth, very bitter, besprinkled all over with minute glandular dots. Flower-stalks scattered and terminal, aogular, roughish, slender, single-flowered, with one linear *bractea*. Calyx turbinate; its leaves obovate, besprinkled with minute shining dots, and beautifully tinged with violet. Corolla yellow; the radiant florets but one or two, ovate; those of the disk about six. Seeds square, with bristly angles. Down of five or more very beautiful, rather unequal, lanceolate, acute, membranous, glittering scales, all streaked with purple, their edges more or less deeply jagged or fringed. These scales are about as long as the *corolla* of each floret, and we do not find them ever accompanied with any bristles. A comparison of the *seed-down* with that of the last, will sufficiently shew, that the present plant is not authorized to rank as a distinct genus on that account. As to the habit, the *leaves* being alternate is more material than their division, to which last character the fringes of the other species may be considered as an approach. That they are full of glandular dots we readily perceive; though Lamarck indicates the contrary, as a difference between this plant and *Pectis*, all whose species, he rightly says, have dotted leaves. Roth appears to have known nothing of *Pectis*, at least on his first establishment of his genus *Schkubria*; nor was he perhaps sufficiently aware of the perils of such an undertaking, in this intricate class. The name of Schkuhr, notwithstanding its unfortunate orthography, is richly entitled to botanical commemoration, and we trust that some stable genus will, hereafter, be honoured with the charge of conveying it down to posterity. S.

PECTIS, an ancient musical instrument, of the form or use of which we are not very certain. Athenæus says, that the *pectis*, *magadis*, and *barbiton*, were the same instrument. It has been supposed to have been a dicord, a small instrument of two strings, with a neck, or finger-board, by which they were shortened with the pressure of the fingers, and a complete scale produced.

PECTORAL, something relating to the breast, *pectus*. In the Romish church, bishops, and regular abbots, wear a pectoral cross, *i. e.* a little cross of gold, hanging from the neck down to the breast.

PECTORAL Medicines, in the language of the older physicians, were all those medicines which were appropriated to the relief of the disorders of the breast or lungs. The epithet, however, was indefinite, inasmuch as it included demulcents, attenuants, astringents, and even anodynes, or whatever contributed to ease the breathing and cough. It has, therefore, been discarded. The more limited term, *expectorants*, is preferable.

PECTORAL Syrup. See SYRUP.

PECTORAL Wine. See WINE.

PECTORALE, or PECTORAL, in the Jewish Law. See RATIONALE.

PECTORALES, in Anatomy, two muscles placed on the front of the chest.

The *pectoralis major* (sterno-humerien) is the largest of the two, covers the front of the chest and of the axilla, and extends from the clavicle, the sternum, and the cartilages of the true ribs, to the front edge of the bicipital groove of the humerus. It is broad, and approaches to the triangular figure.

Its anterior surface is covered by the skin, the fibres of the latissimus colli being interposed between them above, and the mammary gland about the middle. The posterior surface covers, towards the inner side, the front of the sternum, to which it is attached; more externally, the cartilages of the true ribs, to which it is also attached, excepting the first and sometimes the last. This attachment is observed towards the sternal ends of the cartilages, and occupies a broader space in the lower than in the upper ones: it extends through the whole length of the sixth. Below the latter, it covers the rectus and obliquus externus abdominis. It also covers, in succession, beginning from the sternum, the true ribs, the external intercostal muscles, the subclavius, the pectoralis minor, the serratus magnus, the axillary vessels, the brachial plexus, and the coraco-brachialis and biceps muscles. The surface of the muscle is united to the parts just enumerated by loose cellular tissue, the quantity of which increases as we approach the axilla.

The internal edge is somewhat femicircular in its outline, and is fixed to the middle of the front of the sternum from its upper part, to the articulation of the cartilage of the sixth rib. In front of the ensiform cartilage it is confounded with the edge of the opposite muscle, and has a connection with the upper end of the linea alba; a small slip of its fibres is also connected to the upper edge of the aponeurosis of the obliquus externus abdominis, and generally covers the upper slip of that muscle.

The upper edge may be divided into two parts; the first, which is properly superior, is attached to the inner half of the front edge of the clavicle: the second is rather external, and is stretched obliquely from the clavicle to the humerus. The latter is directed downwards and outwards, and is nearly parallel to the inner edge of the deltoid, from which it is separated by a cellular line, broader above than below, and containing the cephalic vein. Sometimes the edges of the two muscles are confounded.

The lower edge is connected to the aponeurosis of the obliquus externus, goes obliquely outwards and backwards in front of the chest, then before the axilla, of which it forms the front edge; it then descends a little, and terminates on the humerus. This edge is thin towards the chest, and thicker at the axilla, where the skin turns in a little on its posterior edge.

The

The superior and inferior margins of the great pectoral muscle are united at a truncated angle, about two inches broad, attached to the front edge of the bicipital groove.

The sternal and the clavicular portions of the muscle may be more or less distinct from each other: they can sometimes be separated throughout.

The attachments to the clavicle and sternum are by no means of very short aponeuroses: those of the right and left muscles decussate in the front of the sternum. Towards the lower part of the chest, and upper part of the abdomen, a broader aponeurosis is seen, united to that of the obliquus externus. To the humerus the pectoralis major is attached by a broad tendon, from which productions are continued to line the bicipital groove, united to the tendons of the latissimus dorsi, teres major, and supra spinatus, and to form a connection with the aponeurosis covering the muscles of the arm. This tendinous insertion, and the muscular fibres connected to it, are twisted on themselves: the fibres of the clavicular portion are on the outside, and pass downwards: those of the pectoral are behind the former, and pass upwards.

The muscular fibres are not all alike in length or direction. Those which come from the clavicle are the shortest, descend from within outwards, and terminate on the front of the tendon. The fibres from the upper part of the sternum are rather longer, go horizontally outwards, and end on the front of the tendon, externally to the former. The remaining fibres go from below upwards, and increase in length and obliquity from above downwards: they end on the posterior surface of the tendon, and are turned in successively, one under the other, as they reach the tendon, so that the lower ones are fixed to the upper part of the tendon.

This muscle executes the reciprocal motions of the chest and arm. If the latter be hanging by the side of the body, the pectoralis major will move it forwards and inwards, so as to carry it across the front of the chest: when the arm has been elevated, it will draw the limb down again: it will also retract the humerus inwards, particularly if it has been turned out. The clavicular portion will co-operate with the deltoid in elevating the humerus. Acting in conjunction with the latissimus dorsi and teres major, it will draw the limb close to the side. When the arm is fixed, as in seizing any body before or above us, this muscle brings the trunk to the arm: hence it is an important agent in climbing.

The *pectoralis minor* (*ferratus minor anticus*, *collo-coracoidien*) lies on the front and upper part of the chest, and extends from the third, fourth, and fifth ribs to the coracoid process: it is flattened and triangular, with the basis of the triangle turned downwards and inwards, the apex upwards and outwards. The anterior surface is covered by the pectoralis major; the posterior covers the ribs, the intercostal muscles, the *ferratus magnus*, axillary vessels, and brachial plexus. The upper and lower edges are unattached, and present nothing remarkable: the former is the shortest. The basis of the muscle, turned downwards and inwards, is fixed to the upper edge and external surface of the ribs mentioned above, or to the second, third and fourth, by broad and thin aponeuroses. Thence it is continued backwards and outwards, growing at the same time narrower, and is fixed to the coracoid process, where it is connected to the coracobrachialis.

The aponeuroses, by which it is fixed to the ribs, have been mentioned: a flattened tendon connects it to the coracoid process: the fleshy fibres are continued obliquely between these, slanting from below upwards, backwards, and outwards: the upper are the shortest.

By drawing the coracoid process downwards and forwards, this muscle rotates the scapula, so that the anterior angle is depressed, and the inferior goes backwards. The rhomboidei and levator scapulae assist in producing the same effect. When it concurs with the *ferratus magnus*, the scapula is carried directly forwards. Supposing the shoulder to be firmly fixed, it may elevate the ribs, and thus assist in inspiration: the same remark will hold good of the pectoralis major also: hence, in asthmatic persons, and all those who breathe difficultly, the shoulders are habitually elevated, to bring these muscles into play, and they are more forcibly drawn up in the paroxysms of obstructed respiration.

PECTOREL, in our old writers, armour for the breast, a breast-plate, or petral for a horse. It is mentioned stat. 14 Car. II. cap. 3.

PECTORIS Os, in *Anatomy*, the same as sternum.

PECTORIS *Hydrops*. See *DROPSY of the Breast*.

PECTORIS *Osse*, in fish. The bones of the breast and belly are best sought after in the cetaceous and spinose kinds. In the spinose kinds they are these; the clavicles, the sternum, the scapulæ, or bones to which the pinnæ pectorales are affixed at their basis, the bones at the roots of the pinnæ ventrales.

The number, situation, and figure of these differ greatly in the several kinds of fish, and make very essential characters. See *FISH, Anatomy of*.

PECTORIS *Triangularis*. See TRIANGULARIS and PECTORALES.

PECUARI, among the Romans, those who farmed the public pastures, in order to let them to advantage.

PECUL, or PICUL, in *Commerce*, a weight used in some parts of the East Indies. The bahar of three peculs, or 300 catties, in Bantam weighs 396 lb. avoirdupois. The pecul of 100 catties at Cheribon weighs 125 lb. Dutch troy weight, or 132 lb. avoirdupois. Heavy goods are weighed in Malacca by the pecul of 100 catties, or 1600 taels. The pecul is = 135 lb. avoirdupois, and three peculs make a bahar. But what is called the China pecul at Malacca weighs 125 lb. avoirdupois. Rice is sold by the coyang of 40 peculs, or 5400 lb. avoirdupois. A coyang of rice in the isle of Amboyna contains 25 peculs. The pecul of pepper at Banjarmasin is 100 catties, or 125 lb. Dutch troy, or 135 lb. 10 oz. avoirdupois. The pecul and catty at Macassar are the same. In the isle of Ternate, the pecul and catty are the same as at Amboyna. The pecul in Siam is 50 catties, and the catty 20 taels, or 80 ticals. The Siam pecul weighs 129 lb. avoirdupois, and the catty 41 oz. 4½ dr. avoirdupois. The common weight in Trangania, on the farther peninsula, is the China pecul, which answers to 132 lb. 8 oz. 9 dr. avoirdupois.

PECULATE, PECULATUS, in the *Civil Law*, the crime of embezzling the public money, by a person who has the management, receipt, or custody thereof: so called *quasi pecunie ablatio*.

Civil lawyers use peculate for any theft of a thing, either sacred, religious, public, or fiscal. Peculate in the case of public money, is prosecuted even on the criminal's heir.

The Julian law, among the Romans, punished this crime with death in a magistrate; and with deportation, or banishment, in a private person. With us it is not a capital crime, but subjects the committer of it to a discretionary fine and imprisonment.

PECULIAR, in the *Canon Law*, a particular parish, or church, which hath jurisdiction within itself, for probate of wills, &c. exempt from the ordinary of the diocese, and the bishops' courts.

There are *royal peculiars*, and *archbishops' peculiars*.

The

The king's chapel is a royal peculiar, exempt from all spiritual jurisdiction, and reserved to the visitation and immediate government of the king himself, who is supreme ordinary.

Peculiar of the archbishops are exclusive of the bishops and archdeacons.

It is an ancient privilege of the see at Canterbury, that wherefoever any manors or advowsons do belong to it, they forthwith become exempt from the ordinary, and are reputed peculiar. In the province of Canterbury, there are more than a hundred such peculiar. In these peculiar jurisdiction is administered by several commissaries; the chief of whom is the dean of the arches for the thirteen peculiar within the city of London. See ARCHES.

There are also peculiar of bishops, exclusive of the jurisdiction of the bishop of the diocese in which they are situated: of these the bishop of London hath four parishes within the diocese of Lincoln; and every bishop, who hath a house in the diocese of another bishop, may therein exercise episcopal jurisdiction.

There are also peculiar of bishops in their own diocese, exclusive of archidiaconal jurisdiction.

The peculiar of dean, deans and chapters, prebendaries, &c. are places in which, by ancient compositions, the bishops have parted with their jurisdiction, as ordinaries to those societies. See COURT of Peculiar.

PECULIUM, the stock which a person in the power or property of another, as a slave, minor, or the like, may acquire by his own industry, without any advance or assistance from his father or master; but merely by their permission.

The word is usually derived *a pecunia et pecoribus*; because the whole estate anciently consisted in money and cattle.

PECULIUM is also used, among the Romanists, for what each monk or religious reserves, and possesses to himself.

Some say, that the peculium of a religious, when preferred to a cure, does not cease to belong to the monastery; and that the property thereof never absolutely resides in the religious himself.

PECUNIA, MONEY. See MONEY.

PECUNIA, in our old law-books, is sometimes used for cattle, and sometimes for other goods, as well as money.

In the emendation of the laws of Edward the Confessor, by William I., it is ordered, that no *viva pecunia, living money, i. e. cattle*, be bought or sold, except within cities, and that before three sufficient witnesses.

So in Domesday book, pecunia is frequently used, *pro pecude*; as pasture *ad pecuniam villa*.

PECUNIA *Ecclesia*, was anciently used for the estate of the church.

PECUNIA *Sepulchralis* was money formerly paid to the priest at the opening of the grave, for the good and behoof of the deceased's soul; and which our Saxon ancestors called *soul-fee*, and *animæ symbolum*.

PECUNIA, in *Mythology*, a goddess among the Romans, whom they invoked with a view of procuring money in abundance. But as the specie was coined of different metals, especially of gold, silver, and brass, and as one divinity would have too much occupation in taking care of the different coinages a particular one was appointed for each. Three goddesses represented upon some medals of the emperor Commodus and his successors, with a pair of scales, the cornucopia, and a heap of money by them, prove that there was at least that number, and the antiquaries agree that they presided over the coinage of three metals. Besides

these three divinities, there was also "Æs," or "Æsculanus," for the brass coin.

PEDACE, in *Geography*, a town of Naples, in Calabria Citra; 6 miles S. of Cosenza.

PEDACONDA, a town of Hindoostan, in Mysore; 15 miles E. of Chinna-Balabarum.

PEDAGE, PEDAGIUM, toll, or a local due exacted on persons, goods, and carriages, passing through certain places.

Pedage is usually levied for the repairing of roads, bridges, and causeways, the paving of streets, &c.—Anciently, those who had the right of pedage, were to keep the roads secure, and answer for all robberies committed on the passengers between sun and sun; which is still observed in some parts of England and in Italy, where there were guards, called *stationarii*, established for the security of merchants, particularly at Terracina, on the road between Rome and Naples.

PEDAGOGUE, or PEDAGOGUE, παιδαγωγός, formed from παιδων αγωγός, *puerorum duñor, leader of boys*, a tutor or master, to whom is committed the discipline and direction of a scholar, to be instructed in grammar and other arts.

M. Fleury observes, that the Greeks gave the name pedagogues to slaves appointed to tend their children, lead them, teach them to walk, conduct them to school, &c. The Romans also give the same denomination to the slaves who were entrusted with the care and instruction of their children.

PEDALE, as *à pedale*, implies a long note in the *basso continuo*, or thorough-bass, to be played or sustained without chords. See TARTO Solo.

PEDALES. See ABBOT.

PEDALINÆ, in *Botany*, a natural order of plants, established by Mr. R. Brown, Prodr. Nov. Holl. v. 1. 519, and named from *Pedaliium*, which belongs to it; see the next article. The characters are these.

Calyx in five, nearly equal, divisions.

Corolla of one petal, below the germen, irregular; its throat inflated; limb two-lipped.

Stamens four, two longer than the rest, included within the tube, and accompanied by the rudiment of a fifth.

Germen surrounded at the base with a glandular disk, of several cells, with one or two seeds in each. *Style* one. *Stigma* divided.

Drupa dry, armed with spines, of several cells.

Seeds with a paper-like skin. *Albumen* none.

Embryo straight.

Herbs with opposite leaves, and axillary flowers accompanied by a pair of bractæas.

PEDALIUM, a Greek name, chosen for this plant by professor David Van Royen, in allusion, as it seems, to the shape of the fruit. Πηδαλιον is, as professor Martyn says, the *rudder of a ship*, which each dilated angle, or wing, of the part in question somewhat resembles; but the Greek word also means a *stud, button, or head of a nail*, and the regular, or artificial figure of the whole fruit, reticulated like *lillagrec*, might well suggest such an application of it here.—Linn. Gen. 327. Schreb. 430. Willd. Sp. Pl. v. 3. 401. Mart. Mill. Dict. v. 3. Juss. 140. Lamarck Illustr. t. 538. Gærtn. t. 58.—Class and order, *Didynamia Angiospermia*. Nat. Ord. "*Luride, Perfonate, or perhaps Aggregated,*" Linn. *Bignonia*, Juss. *Pedalina*, Brown.

Gen. Ch. *Cal.* Perianth inferior, minute, in five deep segments; the lower ones longest. *Cor.* of one petal, slightly ringent; tube triangular, flat in front; limb flat, spreading, in five deep, rounded segments, the upper ones smallest, the

lower

lower one largest of all. *Stam.* Filaments four, shorter than the tube, hairy at the base, two of them shortest; anthers heart-shaped, two-lobed, terminated by a gland, and cohering in the form of a cross. There is, according to Rottböll, between the shorter stamens, the rudiment of a fifth filament, with a minute anther. *Pist.* Germin conical; style the length of the stamens; stigma cloven, its upper segment reflexed, the lower revolute. *Peric.* Drupa dry, fibrous, stalked, ovate, somewhat pyramidal, with four furrows, and as many angles, each of which bears a horizontal spine at its base. *Seed.* Nut of two cells, with four wings, and clothed with the rigid, permanent, branched and entangled fibres of the drupa. Kernels two in each cell, oblong, one above the other, each clothed with a dry membranous bivalve tunic.

Ess. Ch. Calyx in five deep segments. Corolla slightly ringent; its limb in five flat segments. Stigma two-lobed. Drupa dry, fibrous, with four spines. Nut of two cells, with four tunicated seeds.

Obs. This genus is thought to differ from JOSEPHINIA, see that article, in having but two lobes to the stigma instead of four, fewer cells in the fruit, and solitary seeds. Perhaps the genera are not naturally distinct, but we have not compared them in a sufficiently perfect state to decide. In habit they are very similar. We have corrected the original generic character; not only from the remarks of Rottböll and Gärtner, but from the manuscript emendations of Linnæus himself, annexing his own various conjectures, as to the natural order. What Gärtner terms an empty cell, appears merely a hollow stalk to the fruit.

1. *P. Murex.* Linn. Sp. Pl. 892. Burm. Ind. 139. t. 45. f. 2. (Murex; Linn. Zeyl. 205. Caka Mullu; Rheede Malab. v. 10. 143. t. 72. *Gartn.*)—Native of maritime situations, in Ceylon, and on the Malabar coast. *Root* annual. *Herb* very various as to luxuriance, of a somewhat fleshy and glutinous or greasy habit, like *Chenopodium album*, or Fat Hen. *Leaves* imperfectly opposite, sometimes all alternate, stalked, simple, obovate, obtuse, abrupt, coarsely toothed. *Flowers* axillary, solitary, stalked, the tube of the corolla about an inch long; their colour apparently white, or pale reddish. *Fruit* drooping, singularly elegant at an advanced period, when the branched entangled fibres become visible.

Rottböll says the smell of musk is very powerful in the flowering plant. We are told that the herb infused in water gives out an abundant colourless and insipid mucilage, and that it is used on the coast of Coromandel to turn water into a clear jelly, for what particular use is not mentioned. We find no such result from pouring boiling water on the dried leaves.

PEDALS, keys for the feet in almost all the large organs on the continent of Europe. The invention is recorded by Prætorius, Syntag. Mus. and ascribed to Bernard, a German organist at Venice, so early as the year 1470. (See ORGAN.) This discovery manifested great progress in the construction and performance of that noble instrument at so early a period; and seems to imply ideas of harmony and effects, beyond the power of human hands.

PEDANEUS, in the *Civil Law*, a petty judge who has no formal seat of justice, but hears causes standing, and without any tribunal.

The word seems formed from *stans in pedibus*: and is used among the ancients by way of opposition to those magistrates who were seated in the curule chair, in *sella curuli*, or had a tribunal or bench raised on high.

The Roman pedanei therefore, were such as had no tri-

bunal, nor pretorium; but rendered justice *de plano*, or *plano pede*.

From the eighty-second Novel, it appears that the emperor Zeno established these pedanei in the see of every province; and that Justinian erected seven of them at Constantinople, in manner of an office: granting them power to judge in any sum as high as three hundred crowns.

PEDANT, a schoolmaster, or pedagogue, who professes to instruct and govern youth, and teach them the literæ humaniores and the arts.

PEDANT is also used for a rough unpolished man of letters, who makes an impertinent use of the sciences, and abounds in unseasonable criticisms and observations.

Dacier defines a pedant, a person who has more reading than good sense.

Pedants are people ever armed with quibbles and syllogisms; they breathe nothing but disputation and chicanery, and pursue a proposition to the last limits of logic.

Malebranche describes a pedant as a man full of false erudition, who makes a parade of his knowledge, and is ever quoting some Greek or Latin author, or hunting back to a remote etymology.

St. Evremont says that to paint the folly of a pedant, we must represent him as turning all conversation to some one science or subject with which he is best acquainted.

There are pedants of all conditions, and of all robes. Wicquefort says, an ambassador, always attentive to formalities and decorums, is nothing else but a political pedant.

PEDANTRY, or PEDANTISM, the quality or manner of a pedant.

To swell up little and low things, to make a vain show of science, to heap up Greek and Latin without judgment, to tear those to pieces who differ from us about a passage in Suetonius, or the etymology of a word, to stir up all the world against a man for not admiring Cicero enough, to be interested for the reputation of an ancient as if he were our next of kin, form what we properly call pedantry.

PEDARIAN, in *Antiquity*, those senators who signified their votes by their feet, not their tongues; that is, such as walked over to the side of those whose opinion they approved of, in divisions of the senate.

The origin of the word Dr. Middleton thinks owing to this, that though the magistrates of Rome had a right to a place and vote in the senate, as well during their office as after it, and before they were put upon the roll by the censors, yet they had not probably a right to speak or debate there on any question, at least in the earlier times of the republic. For this seems to have been the original distinction between them and the ancient senators, as it is plainly intimated in the formule of the consular edict, sent abroad to summon the senate, which was addressed to all senators, as those who had a right to vote in the senate. From which distinction, these last, who had only a right to vote, were called, by way of ridicule, pedarian; because they signified their votes by their feet, not their tongues, and, upon every division of the senate, went over to the side of those whose opinions they approved. It was in allusion to this old custom, which seems, however, to have been wholly dropt in the later ages of the republic, that the mute part of the senate continued still to be called by the name of pedarians, as we learn from Cicero, who, in giving an account to Atticus of a certain debate and decree of the senate upon it, says, that

that it was made with the eager and general concurrence of the pedarians, though against the authority of all the confulars. Vide Festus in voc. Senatores, A. Gell. lib. iii. 18. Felt in Pedarius. Cicero ad Attic. 1. 19. Middleton. of Rom. Sen. p. 86. seq.

PEDATUM FOLIUM, in *Botany*, a foot-like leaf, is so called rather by way of contrast to a palmate or hand-like one, than from any very precise resemblance to the foot of any animal. It is compound, being in the first instance ternate, and the two lateral leaflets are each, more or less numerously, subdivided in front. *Helleborus fatidus* and *niger* have this sort of foliage.

PEDATURA, in *Roman Antiquity*, was used for a space or proportion of a certain number of feet set out.

The word occurs frequently in writers about military affairs; thus in Hyginus, de Castrametatione, we meet with "meminerimus itaque ad computationem cohortis equitatus milliaria pedaturam ad mille trecentos sexaginta dari debere;" which is to be thus explained: the pedatura, or space allowed for a cohort equitata or provincial cohort, consisting of both horse and foot, could not be the same as the pedatura of a uniform body of infantry, of the same number, but must exceed it by 360 feet; for the proportion of the room of one horseman to one foot soldier, he assigns as two and a half to one. Vide Phil. Trans. N^o 482. sect. 3.

PEDDAGUDAMY, in *Geography*, a town of Hindoostan, in the circar of Ellore; 10 miles N.W. of Ellore.

PEDDAPOUR, a town of Hindoostan, in the circar of Rajamundry; 22 miles E.N.E. of Rajamundry.

PEDDI-BALABARUM, a town of Hindoostan, in Mysore; 16 miles N. of Bangalore.

PEDEE, GREAT, a river of America, which rises in the Appalachian mountains, in North Carolina, where it is called Yadkin river. In South Carolina it takes the name of Pedee, and after receiving the waters of Lynche's creek, Little Pedee, and Black river, joins the Wakkamaw river, near George-town. These united streams, with the accession of a small creek, on which George-town stands, form Win-yaw bay, which, about 12 miles below, communicates with the ocean. It is navigable for boats of 60 or 70 tons, about 200 miles.

PEDEE, Little, a river that rises in several branches, in North Carolina, and unites with the Great Pedee in South Carolina, about 32 miles from the ocean.

PEDEMONTE D'ALISI, a town of Naples, in Lavora; 20 miles N.N.E. of Capua.

PEDENA, or **BIBEN**, a town of Iltria, the see of a bishop; 25 miles S.S.E. of Trieste. N. lat. 45° 22'. E. long 14° 16'.

PEDERNEIRA, a sea-port town on the W. coast of Portugal, in the province of Estremadura, containing about 1300 inhabitants; 18 miles S.W. of Leyria. N. lat. 39° 31'. W. long 8° 56'.

PEDERSORE, a town of Sweden, in the government of Wafa; three miles S. of Jacobstad.

PEDESTAL, formed from *pes, pedis, foot*, and *σῦλος, column*, in *Architecture*, the lowest part of an order of columns; being that which sustains the column, and serves it as a foot to stand on.

The pedestal, called by the Greeks *stylobates*, and *stereobates*, consists of three principal parts; viz. a square trunk, or dye, which makes the body; a cornice, the head; and a base, the foot of the pedestal.

The pedestal is properly an appendage to a column; not an essential part thereof; though M. le Clerc thinks it is essential to a complete order.

The proportions or ornaments of the pedestal are different

in the different orders: Vignola, indeed, and most of the moderns, make the pedestal, and its ornaments, in all the orders, one-third of the height of the column, including the base and capital: but some deviate from this rule.

M. Perrault makes the proportion of the three constituent parts of pedestals, the same in all the orders; viz. the base one-fourth of the pedestal; the cornice an eighth part; and the socle, or plinth, of the base, two-thirds of the base itself. The height of the dye is, what remains of the whole height of the pedestal.

PEDESTAL, Tuscan, is the simplest and the lowest of all. Palladio and Scamozzi make it three modules high; Vignola five. Its members, in Vignola, are only a plinth, for a base; the dye; and a talon crowned, for a cornice. This has rarely any base.

PEDESTAL, Doric, Palladio makes four modules five minutes high; and Vignola five modules four minutes.

In the antique, we not only do not meet with any pedestals; but even not with any base, in the Doric order.

The members in Vignola's Doric pedestal, are the same with those in the Tuscan, with the addition of a mouchette in its cornice.

PEDESTAL, Ionic, in Vignola and Serlio, is six modules high; in Scamozzi five; in the temple of Fortuna Virilis it is seven modules two minutes. Its members and ornaments are mostly the same with those of the Doric, only a little richer. The pedestal now usually followed, is that of Vitruvius, though we do not find it in any work of the antique. Some, in lieu hereof, use the Attic base, in imitation of the ancient.

PEDESTAL, Corinthian, is the richest and most delicate of all. In Vignola it is seven modules high; in Palladio, five modules one minute; in Serlio, six modules fifteen minutes; in the coliseum, four modules two minutes.

Its members, in Vignola, are as follow; in the base are a plinth, for a socle: over that a tore carved; then a reglet, a gula inverted and enriched, and an astragal. In the dye are a reglet, with a conge over it; and near the cornice a reglet, with a conge underneath. In the cornice is an astragal, a frieze, fillet, astragal, gorge, and a talon. See each under its proper article.

PEDESTAL, Composite, in Vignola, is of the same height with the Corinthian, viz. seven modules; in Scamozzi, six modules two minutes; in Palladio six modules seven minutes; in the Goldsmith's arch, seven modules eight minutes.

Its members, in Vignola, are the same with those of the Corinthian; with this difference, that, whereas these are most of them enriched with carvings in the Corinthian, they are all plain in the Composite. Nor must it be omitted, that there is a difference in the profiles of the base and cornice, in the two orders.

The generality of architects, Daviler observes, use tables or panels, either in relieve, or creux, in the dyes of pedestals, without any regard to the character of the order. Those, in relieve, he observes, only fit the Tuscan and Doric; the three others must be indented: but this, he adds, is a thing the ancients never practised, as being contrary to the rules of solidity and strength.

PEDESTAL, Square, is that whose height and width are equal; as that of the arch of the lions at Verona, of the Corinthian order; and such some followers of Vitruvius, as Serlio, Philander, &c. have given to their Tuscan orders.

PEDESTAL, Double, is that which supports two columns, and is larger in width than height.

PEDESTAL, Continued, is that which supports a row of columns without any break or interruption; such is that which sustains

sustains the fluted Ionic columns of the palace of the Thuileries on the side of the garden.

PEDESTALS of Statues, are those serving to support figures or statues.

Vinci observes, there is no part of architecture more arbitrary, and in which more liberty may be taken, than in the pedestals of statues; there being no laws prescribed for them by antiquity; nor any even settled by the moderns.

There is no settled proportion for these pedestals; but the height depends on the situation, and the figure they sustain. Yet, when on the ground, the pedestal is usually two-thirds, or two-fifths, of that of the statue; but always the more massive the statue, the stronger must be the pedestal.

Their form, character, &c. are to be extraordinary and ingenious, far from the regularity and simplicity of the pedestals of columns. The same author gives us a great variety of forms, oval, triangular, multangular, &c.

PEDESTRIAN STATUE. See **STATUE.**

PEDIÆAN, πεδῖαιος, in *Antiquity*. The city of Athens was anciently divided into three different quarters; one on the descent of a hill; another on the sea-shore; and a third in a plain between the other two.

The inhabitants of the middle region were called Πεδῖαιος, *Pediæans*, formed from πεδῖον, *plain* or *flat*: or, according to Aristotle, *Pediaci*: those of the hill, *Diacrians*: and those of the shore, *Paraliens*.

These quarters usually composed so many different factions. Pisistratus made use of the *Pediæans* against the *Diacrians*.

In the time of Solon, when a form of government was to be chosen, the *Diacrians* would have it democratic: the *Pediæans* demanded an aristocracy; and the *Paraliens* a mixed government.

PEDICELLARIA, in *Natural History*, a genus of the class and order Vermes Mollusca: the generic character is, that it has a body soft and seated on a rigid fixed peduncle; the aperture is single. There are three

Species.

GLOBIFERA. This is described as having a spherical head. It inhabits the Northern seas, among the spines of the Echini. The body is minute, and resembling a mucor; the head is reddish, having the appearance of a small cherry; the stem is tawny, and covered with a gelatinous hyaline skin.

TRIPHYLLA. The head of this is three-lobed; the lobes are nearly square and unarmed; the neck is round. It is found in the Northern seas, among the spines of Echini. The head has reddish or hyaline lobes, sometimes ovate; the neck is flexuous and blue; the peduncle or stem is of a chestnut-brown.

TRIDENS. Head three-lobed, the lobes are oval and awned; the neck is round. It inhabits also the Northern seas, and likewise among the spines of Echini. The neck is smooth and hyaline, though sometimes it is reddish; the lobes of the head are sometimes four, and thrice as long as the neck, rarely unarmed with awns; the peduncle is reddish, and three times as long as the neck.

PEDICELLUS, in *Botany*, a partial flower-stalk, or the ultimate subdivision of a general one. See **PEDUNCULUS.**

PEDICLE, **PEDICELLUS**, a diminutive of *pes*, *foot*, *footstalk*; that little stalk whereby the leaf, fruit, or flower, is sustained, and connected to its branch or stem. (See the preceding article.) Flowers will keep fresh a long time after gathering, by immersing their pedicles in water. The great secret of preserving fruits for the winter is to

seal up their pedicles with wax. Cherries with the shortest pedicle are esteemed the best. The pistil of the flower sometimes becomes the pedicle of the fruit.

PEDICULARES, in *Botany*, a natural order of plants, so denominated by Jussieu, from *Pedicularis*, which is one of them; see the next article. It is the second of the eighth class in that author's system, and comprises about a third part of the *Personatæ* of Linnæus; see **PERSONATÆ**. For the characters of Jussieu's eighth class, see **GENTIANÆ**. He thus defines the present order.

Calyx divided, permanent, often tubular. *Corolla* for the most part irregular. *Stamens* definite in number. *Style* one; with a simple, or rarely two-lobed, stigma. *Fruit* capsular, of two cells, with many seeds, and two valves which are connected by a central projection, forming a partition bearing seeds on both sides, and scarcely separable, the edges of the valves unconnected with the partition, and finally separating. The *stem* is mostly herbaceous. *Leaves* either opposite or alternate, each with a single *bractea*.

The first section, distinguished by having the stamens not didynamous, their number two or more, consists of *Polygala*, *Veronica*, *Sibthorpia*, and *Difandra*.

The second section, with four didynamous stamens, that is, two long and two short, has *Ourisia* of Commerson, and *Piriipa* of Aublet, with the Linnæan *Erinus*, *Manulea*, *Castilleja*, *Euphrasia*, *Buchnera*, *Bartsia*, *Pedicularis*, *Rhinanthus* and *Melampyrum*.

A third section consists of four genera akin to true *Pediculares*. These are *Hyobanche*, *Obolaria*, *Orobanche* and *Lathræa*; parasitical plants, about whose germination nothing is, or perhaps can be, known. Their fruit is in a manner unilocular.

The *Pediculares* in general are remarkable for turning black in drying; but this quality does not belong to *Polygala*. That indeed is a genus whose natural affinity is enveloped in much uncertainty, and it seems to us that Linnæus, who refers it to his *Lomentaceæ*, comes nearer the truth than Jussieu.

PEDICULARIS, Loufe-wort, a very noble and beautiful genus of plants; notwithstanding its unpromising name, derived from *pediculus*, a louse, which alludes to a quality attributed to some of the species, of making sheep lousy that feed upon them. This report might perhaps arise, as with respect to the *Drosera* and *Hydrocotyle*, from their growing in watery pastures, where sheep become unhealthy and scabby, whether they feed on any of these herbs, which is very doubtful, or no.—Linn. Gen. 307. Schreb. 403. Willd. Sp. Pl. v. 3. 202. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 655. Prodr. Fl. Græc. Sibth. v. 1. 429. Juss. 101. Lamarck illustr. t. 517. Michaux Boreal-Amer. v. 2. 18. Gærtn. t. 53.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personatæ*, Linn. *Pediculares*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, ovate-oblong, tumid, unequally five-cleft, permanent. *Cor.* of one petal, ringent; tube oblong, gibbous; upper lip helmet-shaped, erect, compressed, emarginate, narrowest; lower spreading, flat, divided about half-way into three obtuse segments, the middle one usually narrowest. *Stam.* Filaments four, the length of the upper lip, under which they are concealed, two of them shortest; anthers incumbent, roundish, compressed. *Pist.* Germen roundish, superior; style thread-shaped, situated like the stamens but longer; stigma obtuse, inflexed. *Peric.* Capsule roundish, pointed, oblique, of two cells, bursting at the top; the partitions narrow, from the centre of each valve. *Seeds* several, ovate, angular, pointed, compressed, with a minute membranous appendage.

PEDICULARIS.

appendage. *Receptacle* roundish, at the bottom of the capsule.

Eff. Ch. Calyx swelling, unequally five-cleft. Upper lip of the corolla notched, compressed. Capsule of two cells, pointed, oblique. Seeds few, angular, pointed.

Very few species of *Pedicularis* were known to the old botanists. Linnæus discovered several in Lapland, as Haller has done in Switzerland, and Jacquin in Austria; but the most numerous acquisitions of this kind have been made in Siberia, by Gmelin, Pallas and others. The second edition of Sp. Pl. contains but 14 species; the 14th of Syst. Veg. 17; Willdenow has 34, having received some new Siberian ones from his friend Stephan. Five of the whole have branched stems, the rest are unbranched, though leafy and many-flowered. All are herbaceous, and perhaps perennial, though authors have marked some as annual. This is certainly erroneous with regard to *incarnata* of Jacquin, and our *sylvatica*, whether the *palustris* be annual, as Ray says, or not. They are with difficulty preserved in a garden, being mostly inhabitants of boggy alpine places, protected by a thick coat of snow throughout a long winter, and very susceptible of any recurrence of cold after they begin to vegetate in the spring. The *foliage* of the whole genus is simply or doubly pinnatifid, with minute, cartilaginous teeth, and remarkable for an elegantly crisped aspect, with rich shining green or purplish hues. The inodorous *flowers* form leafy spikes, and are either crimson or yellowish, but in every case richly variegated with contrasted tints.

The species are well made out in Willdenow, nor do we find it requisite to give detailed descriptions or synonyms of them all. A few examples will suffice, with the addition of two species which appear to be new. Only two are natives of Britain, with which our list commences.

P. palustris. Marsh Loufe-wort, or Tall Red-rattle. Linn. Sp. Pl. 845. Engl. Bot. t. 399. (*Pedicularis*; Riv. Monop. Irr. t. 92.)—Stem solitary, branched. Calyx ovate, hairy, ribbed, in two principal notched divisions. Lower lip of the corolla largest.—Native of boggy meadows, chiefly in the north of Europe; by no means unfrequent in England, flowering in June and July. The *root* is small and tapering, whether annual or perennial remains a doubt, *Stem* solitary, twelve to fifteen inches high, angular, with many opposite, lateral, leafy branches; the angles more or less hairy. *Leaves* scattered, stalked, doubly pinnatifid, smooth; the segments obtuse, notched, very various in breadth. *Flowers* numerous, large, rose-coloured, axillary, about the summits of the stem and branches. *Calyx* ovate, compressed, hairy, pale green or purplish, with a darker-green leafy border in two principal lateral divisions, which are strongly crenate and variously lobed, but the whole, taken together, can scarcely be called five-cleft. The lower lip of the *corolla* is longer and much broader than the upper, in three rounded, dilated, flat segments, minutely fringed. *Seeds* about five or six in each cell. This is an acrid usefess weed, untouched by horses or cows.

P. sylvatica. Pasture Loufe-wort, or Heath Red-rattle. Linn. Sp. Pl. 845. Engl. Bot. t. 400. Fl. Dan. t. 225. (*Pedicularis*; Ger. em. 1071. *P. minor*; Riv. Monop. Irr. t. 92.)—Stem branched at the base, spreading. Calyx oblong, angular, smooth, unequally five-lobed, cut. Radical leaves ovate.—Common with us in moist heathy pastures, among grass and moss, flowering in June and July. In Switzerland this species is very rare, nor does it seem to be well known on the continent, since Willdenow could express a doubt whether it were distinct from the former, and quote the excellent figure in the *Flora Danica* with hesitation.

The *root* is strong and thick, certainly perennial, crowned with a numerous row of sessile, pale, ovate, undivided *leaves*, notched and crisped at their edges, but totally different from the doubly pinnatifid superior *leaves*. These radical *leaves* seem characteristic of the species. The *stem* is divided to the very base into several short, spreading, or decumbent, simple, leafy branches. *Flowers* rose-coloured, very elegant; their *calyx* tubular, mostly smooth, five-lobed; their lower lip in nearly equal segments.—The marquis of Stafford met with a few regular *flowers*, which had five or six *stamens*, on some wild plants near his castle of Dunrobin, North Britain, in 1808.

P. euphrasioides. Willd. n. 3. (P. n. 15; Gmel. Sib. v. 3. 203. t. 43.)—Stem much branched. Calyx oblong, smooth, in two abrupt even segments. Upper lip of the corolla toothed.—Native of Siberia.—We have it also from Labrador, communicated by the late R. Molesworth, esq.—The *stem* is a span high, purplish, polished, with numerous branches from top to bottom. *Leaves* pinnatifid, toothed. *Calyx* with an entire, even border, not cut, crisped, or leafy. *Corolla* yellow, with a purplish upper lip, whose edge is sharply toothed.

P. parviflora.—Stem branched, angular. Calyx ovate, its border leafy, unequally lobed and notched. Upper lip of the corolla without teeth, larger than the lower.—Gathered by Mr. Menzies, on the west coast of North America. The habit is most like that of *P. palustris*, but every part is much smaller, nor does it answer to the description in Willdenow of a supposed variety of that species from Kamtschatka, for the upper *leaves* in ours are all doubly and deeply pinnatifid. The *calyx* is ovate, ribbed, smooth, with an elegant, broad, leafy, lobed and notched border. We find no teeth whatever on the upper lip of the *corolla*, which is longer than the lower; the latter is in three small, rounded, nearly equal lobes. The *flowers* seem to have been red, but the whole herb turns very black in drying. Its height is nearly equal to *P. palustris*.

All the following have simple stems.

P. Sceptrum Carolinum. Linn. Sp. Pl. 845. Willd. n. 7. Fl. Dan. t. 26. Ehrh. Phytoph. 55. (*P. alpina*, folio ceterach; Helw. Fl. 39. t. 39. *Sceptrum Carolinum*; Rudb. Lapp. t. 1. Linn. Lapp. ed. 2. 206. t. 4. f. 4, 5.)—Leaves pinnatifid; their segments broad, lobed, finely notched. Lower flowers whorled. Bractæas ovate, undivided. Calyx crested. Corolla closed.—Found in boggy woods in Hungary, Prussia, Mecklenburg, &c. but especially in Lapland, of which last country it is the most celebrated botanical treasure, being the largest and most stately of this whole genus. We do not find that it has yet been cultivated with success in any garden. The *stem* is a yard high, erect, straight, naked, except a whorl of *leaves* near the bottom. Radical *leaves* most numerous and largest, stalked, a span long, deeply pinnatifid, smooth, finely reticulated, the segments more or less pinnatifid, rounded, broad, with minute cartilaginous teeth. *Flowers* several, in a long, upright spike, the lower ones whorled, the rest chiefly alternate. *Bractæas* large, ovate, concave, crenate, tinged, like the leaves and stem, with purple. *Corolla* an inch and a half long, cream-coloured or pale yellow; the lips closed, elegantly tipped with crimson, the segments of the lower one equal, concave; the upper without teeth.—Rudbeck's wooden cut is truly magnificent.

P. auriculata.—Leaves pinnatifid; their segments oblong, notched. Lower flowers opposite. Bractæas leafy, pinnatifid. Calyx deeply cleft, with two rounded, leafy, crenate lobes. Corolla slightly gaping.—Sent by the Rev. Dr. Muhlenberg, from the neighbourhood of Lancaster in Pennsylvania.

PEDICULARIS.

sylvana. We find no description answerable to this species. The *stem* is simple, little more than a foot high, leafy. *Leaves* all nearly opposite, two inches in length, oblong, mostly smooth and naked, cut, but not deeply, into numerous, parallel, obtuse segments, with a cartilaginous notched edge. *Bractes* similar to the leaves, but gradually smaller. *Calyx* ovate, very smooth, two-lobed, each lobe crowned with a rounded, leafy, notched appendage. *Corolla* an inch long, nearly closed, pale or yellowish, with a tinge of red. The habit of the *leaves*, and the general appearance of the *flowers*, bring this plant near the *Sceptrum Carolinum*, from which nevertheless it is abundantly distinct, as well as from *P. triflis*, whose *corolla* is full as large, but downy at the edges, and whose *leaves* are more finely and deeply divided.

P. recutita. Linn. Sp. Pl. ed. 1. 608. ed. 2. 846. Willd. n. 14? Jacq. Austr. t. 258? (*P. caule simplicis, foliis pinnatis, floribus spicatis, staminibus eminentibus*: Hall. Helvet. v. 1. 138. n. 316. t. 8. f. 2)—*Leaves* deeply pinnatifid; their segments lanceolate, pinnatifid, acutely notched. *Spike* compact, leafy. Upper lip of the corolla crenate, obtuse. *Stamens* prominent.—Native of lofty mountains in Switzerland. We have Haller's plant, on which this species in Linnæus entirely depends. That of Jacquin, sent by himself, which Willdenow appears to have had in view, seems somewhat different, the *corolla* being smaller, its upper lip singularly oblong, rectilinear, and obtuse; nor do the *stamens* seem to project. This last character, however, to which the specific name, such as it is, alludes, is not very obvious at all times. We must leave the final determination of these two plants to those who can compare them fresh. Willdenow has very properly established, by the name of *P. elata*, n. 15, a tall Siberian species, with a long pale-purple *corolla*, which Linnæus confounded with *recutita*.

P. foliosa. Linn. Mant. 86. Willd. n. 16. Jacq. Austr. t. 139. (*P. alpina, flore luteo, radice nigra*; Bauh. Hist. v. 3. 439.)—*Leaves* doubly pinnatifid, in linear segments; the floral ones much longer than the flowers. *Calyx* five-cleft; its upper segment much larger than the rest. Upper lip of the corolla rounded, woolly, very obtuse.—This very fine species is not rare on the alps of Switzerland, Dauphiny, Savoy, Hungary, and Austria. The *root* is tapering, described by Jacquin as perennial, of a pale yellow. Willdenow marks it biennial, but erroneously. John Bauhin calls it black, but otherwise his synonym is the only certain and correct one to be found among the old writers. The plant is readily known by the ample finely divided foliage, which accompanies and envelopes its dense *spike* of pale yellow, numerous, woolly *flowers*, whose prominent palate is of a deeper hue than the rest.—Seeds of this *Pedicularis*, sent by the late Mr. Davall, are said to have vegetated at Kew; but we know not that the plants survived to blossom, nor have we met with this or any other, in perfection, in any garden.

P. acaulis. Scop. Carn. v. 1. 439. t. 31. Wulf. in Jacq. Coll. v. 1. 207. t. 14. Willd. n. 23.—*Stem* none. *Leaves* doubly pinnatifid. *Flower-stalks* radical, single-flowered.—Native of the less elevated mountains of Carniola and Carinthia, where it blossoms early in May, before the snow has disappeared from the more alpine tracts. The *root* is perennial. *Leaves* several, three or four inches long, with hairy stalks. The *flowers* are large, of a pale bluish-colour, springing immediately from the crown of the root, each on a simple hairy stalk, about as long as the *calyx*, which is hairy with a five-cleft leafy border, and scarcely half so long as the *corolla*.

P. flammea. Linn. Sp. Pl. 846. Fl. Lapp. ed. 2. 210 t. 4. f. 2. Tour in Lapland, v. 1. 296. Willd. n. 24, excluding the synonym of Fl. Dan. which rather belongs to *P. hirsuta*.—*Leaves* pinnate; leaflets imbricated, ovate, obtuse, doubly crenate. *Calyx* oblong, five-toothed. Upper lip of the corolla obtuse.—Native of the alps of Lapland, Norway, and Dauria; more sparingly of Switzerland. The *root* is perennial, with many oblong knobs. *Stem* three or four inches high, cylindrical, rather stout. *Leaves* scattered, stalked, of numerous, crowded, small, dark-shining-green leaflets. *Spike* somewhat leafy. *Calyx* oblong, angular, smooth, its teeth scarcely leafy. *Corolla* slender, deep yellow, its upper lip obtuse and brownish or purplish.—This is Haller's n. 315, a rare Swiss species, under which it is remarkable that, both in his *Historia* and *Nomenclator*, he copies from the Sp. Pl. of Linnæus an erroneous citation of Fl. Lapp. t. 11, instead of t. 4; a sign of his not having turned to the plate he quoted. Willdenow has here been more attentive.—Linnæus judged this species to be *P. alpina, folio ceterach*, Bauh. Pin. 163, a plant taken up from Gefner, who but imperfectly describes it. Helwing took the plant of Gefner to be *P. Sceptrum Carolinum*, which indeed answers much better to the idea of the leaves of *Ceterach* than the *flammea*.

P. rosea. Jacq. Misc. v. 2. 57. Ic. Rar. t. 115. Willd. n. 26. (*P. hirsuta*; Allion. Pedem. v. 1. 63. t. 3. f. 1.)—*Stem* nearly naked. *Leaves* deeply pinnatifid; segments linear, sharply pinnatifid. *Flowers* crowded. *Calyx* hairy. Upper lip of the corolla obtuse.—Native of the alps of Carinthia and the north of Italy. The *root* is composed of long fleshy cylindrical branches, running deep into the ground. *Stem* three or four inches high, simple, round, purplish, hairy, almost leafless, except at the top. *Leaves* mostly radical, stalked, finely divided, and acutely toothed. *Flowers* numerous, of an elegant rose-colour, crowded into a short dense spike or head accompanied by two or three leaves, which are rather smaller, and more sessile, than the rest. *Calyx* very hairy, in five unequal segments. Upper lip of the *corolla* oblong, rounded and obtuse; lower in three broad rounded segments, the middle one rather smallest.—Allioni mistook this for the Linnæan *hirsuta*, which is very different, having a leafy *stem*, much broader and ovate segments to the *leaves*, and yellow *flowers*. We believe the latter to be Fl. Dan. t. 30.—It must also be observed that Willdenow cites under *rosea*, Allioni's Specimen, t. 11. f. 1; whereas it is t. 12. f. 1, the other being *comosa*.

P. rostrata. Linn. Sp. Pl. 845. Willd. n. 27. Jacq. Austr. t. 205. (*P. n. 322*; Hall. Helvet. v. 1. 140. t. 8. f. 1, not f. 3, as he himself quotes it!)—*Stem* ascending, slightly leafy. *Leaves* doubly and deeply pinnatifid and toothed. *Flowers* scattered, stalked. Segments of the calyx pinnatifid. Upper lip of the corolla beaked.—Native of Switzerland, Austria, Carniola, Italy, and Dauphiny, on the most lofty mountains. The segments of the *leaves* are shorter and broader than in the last. *Stems* several, less erect. *Flowers* fewer, more distant, on longish partial stalks. *Calyx* much less hairy, with leafy pinnatifid segments. *Corolla* distinguished by the long inflexed beaked upper lip, which is of a deep crimson, the under being rose-coloured, with very broad lateral segments.—Linnæus unaccountably places this species among such as have branched stems.

P. tuberosa. Linn. Sp. Pl. 847. Willd. n. 28. (*P. n. 323*; Hall. Helvet. v. 1. 140. t. 10.)—*Stem* ascending, slightly leafy. *Leaves* doubly and deeply pinnatifid and toothed. *Flowers* crowded, nearly sessile. Segments of the

the calyx pinnatifid. Upper lip of the corolla beaked.—Native of the alps of Switzerland, Italy, and the south of France. Differs from the last in being larger, with more subdivided leaves, and yellow flowers, which are nearly sessile, being crowded into a dense leafy spike. The stem is not more erect, nor more leafy, in one than the other. The floral leaves of both are palmate and bipinnate, and the corolla distinguished by its long beak, which has sometimes a notch at the end in the *tuberosa*, as well as, if we mistake not, in the *rostrata*.

P. gyroflexa. Villars Dauph. v. 2. 426. t. 9. Willd. n. 29. (P. n. 324; Hall. Helvet. v. 1. 140. t. 11. f. 2.)—Stem ascending, slightly leafy. Leaves doubly and very deeply pinnatifid, notched, hairy, somewhat revolute. Upper flowers crowded; lower stalked. Segments of the calyx pinnatifid. Upper lip of the corolla arched, with a short notched beak.—Native of the alps of Switzerland, Italy, and Dauphiny. Most like the last in habit, but the segments of the leaves being slightly revolute, give them a more obtuse and crisped aspect. The corolla is rose-coloured, with a much shorter and blunter beak than either of the two last. These species are all nearly akin, and so similar in a dried state, that it is no wonder botanists in general have not well understood them. *P. fasciculata* of Bellardi, Willd. 30, is confessedly very like them all; but as no authentic specimen has fallen in our way, we can throw no light upon its history. The corolla is said to be in colour like the last; its upper lip not beaked, though approaching to that shape, terminating in three teeth, of which the intermediate one is very short.—These are followed in Willdenow by three Siberian species, called *rubens*, *compacta*, and *achilleifolia*, of which we have seen neither specimen nor figure. The genus concludes with

P. comosa. Linn. Sp. Pl. 847. Willd. n. 34. Allion. Ped. v. 1. 64. t. 4. f. 1. Spec. t. 11. f. 1.—Stem and spike leafy. Leaves doubly and deeply pinnatifid, rough, with bristly teeth. Calyx with five small downy teeth. Upper lip of the corolla cloven, with two small acute points.—Native of mountains in the south of France and north of Italy, but not abundantly; more frequent in the meadows of Russia and Siberia. This is a fine species, approaching to *P. foliosa* in size, habit, and colour, as well as abundance, of flowers; but the floral leaves are smaller and less prominent, and the corolla is smooth, with a round sinus at the extremity of its upper lip, accompanied by a pair of taper teeth. The division of the foliage is very similar in these two species, as also the short downy teeth of the calyx, and they ought to be placed next to each other in a natural disposition of the genus. We have a specimen from Allion himself, as well as others from Siberia.

Besides the two new species which we have added above to Willdenow's list, there are two in Michaux, Boreal-Amer. v. 2. 18, not referrible to any that he enumerates, nor do we know any thing more of them than the following very insufficient characters.

P. lanceolata.—Unbranched. Leaves lanceolate, deeply toothed. Spike leafless. Calyx smooth. Capsules short.—Native of Canada, in the country of the Illinois.

P. gladiata.—Unbranched. Spike leafy. Flowers alternate. Capsule protracted into a sword-shaped point, exceeding its own length. Flowers yellowish.—Native of Pennsylvania.

Our *P. auriculata* is certainly not referrible to either of these.

PEDICULARIS Morbus, from *pediculus*, louse, in *Medicine*, a morbid condition of the habit, and especially of the skin, in which lice are generated in multitudes, and with diffi-

culty destroyed. This disease has been said even to be fatal. See **PHTHIRIASIS**.

PEDICULUS, the Louse, in *Entomology*, a genus of insects of the order Aptera. The generic character is, mouth with a retractile recurved sucker without proboscis; without feelers; the antennæ are as long as the thorax; it has two eyes; the abdomen is depressed; it has six legs formed for running. The insects of this genus live by extracting animal juices; the larvæ and pupæ are six-footed and nimble, resembling the perfect insect. Of these strange and unpleasing animals, some infest the bodies of quadrupeds, others of birds, and some even of insects themselves. It must, however, be observed, that many small insects, infesting other animals, have often been referred to the genus *Pediculus*, which, in reality, belong to those of *Acarus*, *Monoculus*, &c. There are sixty-six species of the genus enumerated by Gmelin.

Species.

* **HUMANUS**. The specific character is, abdomen lobed, cinereous. The *pediculus humanus*, or common louse, is distinguished by its pale livid colour; it is produced from a small oval egg, popularly called by the name of a nit, which is agglutinated by its smaller end to the hair on which it is deposited: from this egg proceeds the insect, complete in all its parts, only much smaller in size. These specimens are far preferable for microscopic observation to the full grown insects, shewing, in a more distinct manner, the disposition of the viscera, muscles, &c. In this state it has such a transparent skin, that we are able to discover more of what passes within its body than in most living creatures. See **LOUSE**.

PUBIS; Crab-Louse. Abdomen emarginate behind; legs cheliform, hence its trivial name. In the antennæ are five articulations. It is found about the hairs of the groin, and sometimes, though very rarely, on the eye-brows of persons who are not attentive to habits of cleanliness.

RICINOIDES. The abdomen is orbicular, marked with a white line; the scutellum is composed of three lobes; the snout is white. It is a native of America. It gets into the legs of the naked inhabitants, where it draws blood, and depositing its eggs in the wound occasions very alarming ulcers.

SUIS. Found on the body of swine.

PORCELLI. Found on the body of the *Cavia cobaya*, or Guinea pig.

CAMELI. Head projecting and pointed; body ferruginous; abdomen ovate. It is found on the camel.

* **OVIS**. This infests the body of the sheep.

BUBALI. Yellowish, with dusky-brown streaks; the abdomen has ten conic marginal tubercles. It is found on the buffalo.

* **BOVIS**. Abdomen with eight transverse ferruginous lines. It inhabits the bodies of oxen, and cattle in general.

* **VITULI**. The abdomen is of a lead colour, and pointed at the end. Found on the bodies of heifers and cattle.

* **EQUI**. Found on the body of the horse.

* **ASINI**. Head projecting, obtuse; abdomen ovate, brown; legs cheliform. Found on the body of the ass.

VULTURIS. Oblong; abdomen brown, with two yellowish lines. It is found in the East Indies on the vulture, and is a large insect. It is farther characterized as having a flat head, yellowish, with black margins; the thorax is yellowish, with a black margin and dorsal line.

* **TINNUNCULI**. Head arrow-shaped, and mucronate on each side behind. Found on the *Falco tinnunculus*, or kestrel.

* **BUTEONIS**.

* **BUTEONIS.** Abdomen margined; the segments with two impressed dots on each side. It infests the Falco buteo, or buzzard.

* **STRIGIS.** Abdomen ovate, white, edged with red; legs red. Found infesting various species of the strix and falco.

* **CORVI.** Abdomen ovate, with a striate margin. Found on various species of the crow.

* **CORNICIS.** Abdomen ovate, pale, with lateral black spots, in which is a white pupil. Found on the common crow.

* **INFAUSTI.** Thorax narrow; abdomen ovate, pale, diaphanous. It infests the Corvus infauti.

* **PICÆ.** Head obtuse, brown, with four black dots. This is found on the Corvus pica, or magpie.

* **ORIOLE.** White, with a brown line on the abdomen. Found on the roller and oriole.

* **CUCULI.** Abdomen oblong, whitish, with brown bands. It infests the Cuculus canorus, or cuckoo.

* **CYGNI.** Head emarginate; abdomen ovate; the margin striate with black. It is found on the swan.

* **ANSERIS.** Filiform, pale; the margin dotted with black. It is found on the wild and tame goose.

* **MOSCHATÆ.** This is found on the Anas moschata, or Muscovy duck.

* **QUERQUEDULÆ.** This infests the Anas querquedula, or garganey.

* **MERGI.** White, with a yellowish head; body long. Found on the Mergus ferrator.

* **PROCELLARIÆ.** Long, filiform, brown; with pale legs. It inhabits Brasil, on the procellaria, or petrel.

* **VAGELLI.** Ovate, pale; thorax with two brown lines. Found on the Procellaria glacialis.

* **DIOMEDEÆ.** Head obtuse; body white; sides of the abdomen black. It inhabits Brasil; on the diomedea, or albatros.

* **STERNÆ.** Head triangular; abdomen ovate, pale; the back longitudinally blackish. Found on various species of the tern and gull.

* **PLATALEÆ.** This species is found on the Platalea leucorodia, or spoon-bill.

* **ARDEÆ.** This is found on several species of the ardea, or crane.

* **GRUIS.** Abdomen sub-clavate, pale, with snowy spiracles. It is found on storks and herons.

* **CICONIÆ.** Long, filiform; abdomen white; the sides dotted with black. It infests storks.

* **CHARADRII.** This species is found on the Charadrius pluvialis, or golden plover.

* **FULICÆ.** This infests the Fulica atra, or common coot.

* **RECURVIROSTRÆ.** This species is oblong, with a triangular grooved head. It is found on the recurvirostra, or avocet.

* **HÆMATOPI.** Glaucous; thorax very narrow; abdomen ovate; with pale incisures. Found on the Hæmatopus ostralegus, or sea-pie.

* **PAVONIS.** Head globular, and very large; body striate, with pale and brown. Found on the peacock.

* **MELEAGRIS.** Head triangular, obtuse; abdomen ovate, grey. This infests the turkey.

* **GALLINÆ.** Thorax and head mucronate on each side. This species infests poultry, and is destroyed by pepper.

* **PHASIANI.** Head ovate and large; abdomen globular, obtuse. It is found on the pheasant.

* **CAPONIS.** Abdomen edged with black. Found on common poultry.

* **TETRAONIS.** This species is found on the Tetrao tetrix, or black game.

* **LAGOPI.** On the Tetrao lagopus, or ptarmigan.

* **COLUMBÆ.** Body filiform, ferruginous, and clavate behind. Found on common pigeons.

* **EMBERIZÆ.** Pale brown; abdomen whitish, with lateral brown spots; head triangular. Found on the bunting.

* **PARI.** Body ovate; tail ending in four bristles. Found on various species of the parus, or titmouse.

* **MOTACILLÆ.** Head heart-shaped, rufous; abdomen white and tapering at the base. It is found on the wag-tail.

* **HIRUNDINIS.** Palish; abdomen black, spotted with white. Found infesting the Hirundo apus, or swift. The abdomen is bristly on both sides.

* **GRYLLOTALPÆ.** Blood-red, with white legs. Found on the mole cricket. The sucker is long, inflected, black; body red, immaculate.

* **APIS.** Body filiform, ferruginous. Inhabits Europe, on bees.

* **FARIONIS.** This is found on the Salmo fario, or trout.

* **ANATIS.** Whitish; first segment of the thorax round, truncate on each side; the abdomen linear and long. On the wild duck.

* **ORTYOMETRÆ.** Oblong; with a heart-shaped head; thorax narrow; segments of the abdomen bristly, with large spotted spiracles on each side. This infests the land-rail.

* **ALAUDÆ.** On the Alauda arvensis, or sky-lark.

* **STURNI.** On the Sturnus vulgaris, or starling.

* **CURVIROSTRÆ.** This is found on the Loxia curvirostra, or grosbeak.

* **PYRRHULÆ.** This infests the Loxia pyrrhula or bull-finch.

* **CLORIDIS.** This is found on the Loxia chloris, or green-finch.

* **CITRINELLÆ.** This infests the Emberiza citrinella, or yellow-hammer.

* **CURRUCÆ.** This is found on the Motacilla curruca, or babbling warbler.

* **RUBECULÆ.** On the Motacilla rubecula, or red-breast.

* **PEDIEUS,** in *Anatomy*, a name given by Riclan to the extensor brevis digitorum pedis communis. Some of the French anatomists still call it le pédieux.

* **PEDIGREE,** a descent, or genealogy.

* **PEDILUVIUM.** See *Bathing of the Feet*, art. FOOT.

* **PEDIMENT,** in *Architecture*, a kind of low pinnacle; serving to crown porticos, or finish a frontispiece; and placed as an ornament over gates, doors, windows, niches, altars, &c.

The pinnacles of the ancient houses, Vitruvius observes, gave architects the first idea of this noble part; which still retains the appearance of its original.

The parts of the pediment are, the tympanum and its cornice. The first is the pannel naked, or area of the pediment, inclosed between the cornice, which crowns it, and the entablature, which serves it as a base, or socle.

Architects have taken a great deal of liberty in the form of this member; nor do they vary less as to the proportion of the pediment. The most beautiful, according to Daviler, is that where its height is about one-fifth of the length of its base.

It is described thus: divide the line *ab* (*Plate XXIII. Miscellany, fig. 12.*) which is the length of the base, into two equal parts, in the point *c*, by means of the perpendicular *fd*; in this perpendicular take the part *ed* equal to *ac*; and from the point *d*, as a centre, describe the arch *aeb*. The point

point of the perpendicular, cut in *e*, will be the top of the pediment *aeb*; and the cornice, and the triangular space included therein, the tympanum.

The pediment is usually triangular, and sometimes an equilateral triangle: this is also called a *pointed* pediment. Sometimes it is circular; though Felibien observes, that we have no instances of round pediments in the antique, beside those in the chapels of the Rotundo. Sometimes its upper cornice is divided into three or four sides, or right lines; sometimes the cornice is cut, or open a top, which is an abuse introduced by the moderns, particularly by Michael Angelo. For the design of this part, at least over doors, windows, &c. being chiefly to shelter those underneath from the rain, to leave it open in the middle is to frustrate its end.

Sometimes the pediment is formed of a couple of scrolls, or wreaths, like two consoles joined together. See CONSOLE.

Sometimes, again, the pediment is without base, or its lower cornice is cut out, all but what is bestowed on two columns, or pilasters, and on these an arch or sweep, raised in lieu of an entablature; of which Serlio gives an instance in the antique, in a Corinthian gate at Foligny in Umbria; and Daviler a more modern one, in the church of St. Peter at Rome.

Under this kind of pediments do also come those little arched cornices which form pediments over doors and windows, supported by two consoles, in lieu either of entablature or columns.

Sometimes the pediment is made double, *i. e.* a less pediment is made in the tympanum of the larger, on account of some projecture in the middle; as in the frontispiece of the church of the Great Jesus at Rome: but this repetition is an abuse in architecture, though authorized by some very good buildings; as the large pavilion of the Louvre, where the caryatides support three pediments, one in another.

Sometimes the tympanum of the pediment is cut out, or left open, to let in light; as we see under the portico of the Capitol at Rome. Lastly, this open pediment is sometimes triangular, and enriched with sculpture, as roses, leaves, &c. as we find in most of the Gothic churches.

M. le Clerc observes, that the modillions in the cornice of the pediment should always answer exactly over those of the entablature. Indeed Vitruvius says, the ancients did not allow any modillions at all in pediments.

The same M. le Clerc observes, that the cornice which serves the pediment as a base, should have no cymatium; by reason the cymatium of the rest of the entablature, when it meets the pediment, passes over it.

This change of determination occasions a considerable difficulty; the cymatium, in this case, appearing too broad in the turn of the angle; to remedy which, the architects have recourse to several expedients.

A pointed pediment may crown three arches; but a circular pediment can only crown one agreeably.

One would never use above two pediments over each other in the same frontispiece; and even where there are two, it would be proper to have the lower circular, and the upper pointed.

PEDINABARUM, in *Geography*, a town of Hindoostan; 60 miles S.E. of Travancore.

PEDINAIG-DURGAM, a town of Hindoostan, in Mysore; 10 miles S.E. of Vencatighery.

PEDIR, a town on the N. coast of the island of Su-

matra; 20 miles E. of Acheen. N. lat. 5° 13'. E. long. 96° 5'.

PEDIS ABSCESSIO, *Cutting off a foot*, a punishment anciently inflicted among us; as appears by the laws of William the Conqueror. "Interdicimus ne quis occidatur, vel suspendatur, pro aliqua culpa, sed eruantur oculi, abscindantur pedes, vel testiculi, vel manus, &c." Leg. Will. cap. 1. So Ingulphus, "sub pena perditionis dexteri sui pedis, &c."

PEDIS minimi digiti abductor, in *Anatomy*. See ABDUCTOR.

PEDIS, abductor pollicis. See ABDUCTOR.

PEDIS, dorsum. See DORSUM.

PEDIS, flexor pollicis. See FLEXOR.

PEDIS interossei, perforans, perforatus, and transversalis. See the respective articles.

Transcriptio PEDIS finis. See TRANSCRIPTIO.

PEDITUM ARRAIATIO. See ARRAIATIO.

PEDLAR. See HAWKER.

PEDMAN, in *Geography*, a town of Hindoostan, in the circar of Guntoor; 10 miles S.S.W. of Guntoor.

PEDN-BOAR POINT, a cape on the S. coast of England, and county of Cornwall; six miles S.E. of Lizard Point. N. lat. 50° 6'. W. long. 5° 8'.

PEDO, in *Natural History*, a name given by some writers to the tipula, or father-long-legs; called also by others grüna, or the crane-fly.

PEDOMETER, or PODOMETER, formed from *πῆδος*, *pes*, *foot*, and *μέτρον*, *measure*, way-wiser; a mechanical instrument, in the form of a watch, consisting of various wheels, with teeth catching in one another, all disposed in the same plane; which by means of a chain or string, fastened to a man's foot, or to the wheel of a chariot, advance a notch each step, or each revolution of the wheel; so that the number being marked on the edge of each wheel, one may number the paces, or measure exactly the distance from one place to another.

An instrument of this kind has been lately invented and improved by Mr. Ralph Gout of Bunhill Row.

The pedometers of Mr. Ralph Gout have an advantage hitherto unknown, *viz.* the hour being attached to them, if required, which makes this instrument doubly useful. Thus, on the same dial is exhibited, at one view, time and distance by means of different hands.

Their internal construction is so very simple, as not to endanger their being put out of order, and if required to be cleaned, a person of the smallest capacity may do it, the wheels being all marked for that purpose.

The patentee has been induced to make various trials with his pedometers in public, one in the right, and one in the left side pocket, in order to establish more effectually their high state of perfection, not only in point of accuracy of the machinery, but to shew the nicety of man's walking.

The same pedometer will, by a proper application to the fiddle, ascertain every pace a horse takes, either in walk, trot, or gallop, and may be made to stop performance in a second, should the horse, in the course of measuring, go from one pace to another. In short, we do not feel the least difficulty in recommending this invention, as the best of the kind ever offered to the public.

PEDOMETER is sometimes also used for the common surveying wheel, an instrument chiefly used in measuring roads; popularly called the *way-wiser*. See PERAMBULATOR.

PEDRA, in *Geography*, a river of Africa, in the kingdom

dom of Adcl, which runs into the Arabian sea, N. lat. 11° 25'.

PEDRA Branca, a large white rock in the Chinese sea. N. lat. 22 19'. E. long. 114° 57'.

PEDRA da Gala, a small island in the Atlantic, near the coast of Africa. N. lat. 21° 48'.

PEDRA da Sureira, a rock or small island in the Atlantic, near the coast of Portugal, at the mouth of the Gopalha; four miles S. of the bay of Oporto. N. lat. 41° 6'. W. long. 8° 23'.

PEDRAÇA, a town of South America, in the government of Caraccas; 25 miles S.S.W. of Varinas.

PEDRAGAO, a town of Portugal, in the province of Elremadura; 30 miles S.E. of Coimbra.

PEDRAPALORE, a town of Hindoostan, in the Carnatic; 20 miles S. of Wandiwash.

PEDRAS, a river on the N.W. side of Punta des Padras, at the southern extremity of Amazon river.

PEDRAZA, a town of Spain, in Old Castile; the birth-place of the emperor Trajan; 21 miles N.E. of Segovia.

PEDRERO, PETERERO, or *Paterero*, a small piece of ordnance, used on board ships, for the discharging of nails, broken iron, or partridge shot, on an enemy attempting to board.

They are generally open at the breech, and their chamber made to take out, to be loaded that way, instead of at the muzzle.

PEDRO, in *Geography*, a town on the N.W. coast of the island of Ternate. N. lat. 0° 50'. E. long. 127 10'.—Also, a small island in the Indian sea, near the W. coast of Madagascar. S. lat. 14° 50'. E. long. 47° 48'.

PEDRO Bay, *Great*, a bay on the S. coast of Jamaica. N. lat. 17° 53'. W. long. 77° 41'. East of it lies Little Pedro point.

PEDRO Bluff, a cape on the S. coast of Jamaica. N. lat. 17° 52'. W. long. 77° 39'.

PEDRO Munoz, a town of Spain, in New Castile; 48 miles S.E. of Toledo.

PEDRO Point, a cape on the N. coast of Jamaica. N. lat. 18° 28'. W. long. 78° 12'.

PEDRO, *St.*, a river of Africa, on the Ivory coast, which runs into the Atlantic, N. lat. 4° 50'. W. long. 6° 50'.

—Also, a town of South America, in the province of Carthagena; 50 miles S. of Mompox.—Also, a town of S. America, in the province of Venezuela, on the S. coast of lake Maracaybo; 100 miles S. of Maracaybo.—Also, a town of Brasil, in the government of Para, on the river Amazons; 440 miles W. of Port Rio Negro.—Also, a town of S. America, in the province of Moxes, on the Mamora; 50 miles S. of Trinidad.—Also, a town of South America, in the audience of Quito; 20 miles N.W. of St. Josef de Huales.—Also, a town of Mexico, in the province of Mechoacan; 15 miles N. of St. Luis de Potosi.

—Also, a small island in the Pacific ocean, near the coast of Terra Firma. N. lat. 4 2'.—Also, a sea-port of Mexico, in the province of Guaxaca; 75 miles S. of Guaxaca. N. lat. 16 . W. long. 99° 1'.—Also, one of the Marquesas islands, called by the natives "Onateya," about three leagues in circuit. S. lat. 9 55'. E. long. 138° 55'.—Also, a town of the bishopric of Truxillo, and jurisdiction of Sana, situated in a fertile soil, near the coast of the Pacific ocean; 50 miles N. of Truxillo. S. lat. 7 26'.—Also, a town of East Florida; 44 miles E.S.E. of St. Mark.—Also, a small island near the coast of Spain, situated S.E. of the city of Cadiz, from which it is separated by a narrow strait, called "St. Pedro's Channel."—Also, a town of

the island of Cuba; 31 miles S.W. of Bayamo.—Also, a town of S. America, in the province of Cordova; 96 miles N. of Cordova.—Also, a town of New Navarre; 180 miles W. of Cata Grandé.—Also, a town of Mexico, in the province of Honduras; 15 miles W.N.W. of Naco.—Also, a bay of the Pacific ocean, on the coast of New Albion, between point Fermin and point Lafuen.

PEDRO Novo, *St.*, a town of Brasil, on a river which runs into the bay of All-Saints; 50 miles N.W. of St. Salvador.

PEDRO e Pablo, *St.*, a river of Mexico, which rises in Tabasco, and runs into the bay of Campeachy, N. lat. 18 20'. W. long. 93° 26'.

PEDRO, *St.* and *St. Pablo*, a river of Mexico, which rises near Zacatlan, in the province of Tlascala, and runs into the gulf of Mexico. N. lat. 10° 52'. W. long. 93° 26'.

PEDRO Nolusco, *St.*, a town of Brasil, on the Urubui; 70 miles N.N.E. of Fort Rio Negro.

PEDRO de Sul, *St.*, a town of Portugal, in the province of Beira; nine miles N.W. of Vifeu.

PEDRO de Taberna, *St.*, a town of Spain, in Aragon; 12 miles N. of Ainsa.

PEDRO de Porco. See *Hog* BEZOAR.

PEDROAS, Os, in *Geography*, a town of Portugal, in Alentejo; nine miles S.W. of Moura.

PEDROAS de Perceveira, rocks near the W. coast of Portugal; two miles S.S.W. of Sines. N. lat. 37° 40'. W. long. 8 52'.

PEDROGAON, a town of Portugal, in Estremadura; 21 miles N.E. of Thomar.

PEDROSA, a town of Spain, in the province of Leon, between Salamanca and Medina del Rio Seco; five leagues from the former.

PEDRUSI, or PEDRUZZI, PAUL, in *Biography*, was born of a noble family at Mantua in 1646. He entered himself among the Jesuits, and became distinguished for his deep knowledge of history and antiquities. He was chosen by Rannuncio, duke of Parma, to arrange his rich and curious cabinet of medals, and to give explanations of them. In 1694 he began to publish an account of this collection, under the title of "I Cæsari in oro raccolti nel Farnese Museo o publicati colle loro congrue interpretazioni," and he continued his labours till his death in 1721. This work, in its complete form, consists of ten volumes, and bears the title of "Museo Farnese;" of these he published seven volumes; and the eighth was edited by Peter Piovene, a brother Jesuit.

PEDUNCLE, in *Botany*. See PEDUNCULUS.

PEDUNCULARIA, a name by which some authors have called the *staphisagria*, or stavesacre: a plant whose seeds are used to kill vermin.

PEDUNCULUS, the flower-stalk, or, as some call it, *peduncle*, springs from the stem, and bears the flowers and fruit, but not the leaves. A flower-stalk originating immediately from the root, has an appropriate name, SCAPUS; see that article; though some prefer *pedunculus radicalis*.

The flower-stalk is either simple or compound; in the first instance it commonly bears a solitary flower, though it may bear a number of completely sessile ones, constituting a spike, as in *Potamogeton*. When compound, the ultimate divisions of this part are called partial flower-stalks. See PEDICELLUS.

Flower-stalks differ in situation, as well as in degree or mode of subdivision.

Pedunculus caulinus springs immediately out of the main stem or trunk, as in *Averrhoa Bilimbi*, and *Cynometra cauliflora*.

P. ramtus grows out of a principal branch, as in *Averrhoa Carambola*, and many other plants.

P. axillaris, an axillary flower-stalk, is very common, and indeed almost general, when the inflorescence is lateral. It proceeds from the bosom of each leaf; that is, immediately above the insertion of the leaf, or its footstalk. The same term is applied to a flower-stalk situated in the fork of a stem, or above the origin of a branch.

P. oppositifolius is inserted opposite to a leaf, of which several species of *Geranium* afford examples.

P. internodis, of more rare occurrence, grows from the intermediate part of a branch between two leaves, as in some species of *Solanum*.

P. interpetiolaris is placed laterally between the insertion of two leaf-stalks, as in some of the *Convolv.*

P. gemmaceus grows out of a leaf-bud, as in the Barberry, and some kinds of Willow; while in others of the last-mentioned genus, some buds are entirely destined to produce leaves, others flowers.

P. terminalis springs from the extremity of a stem or branch, which is very common. It always puts a period to the growth of such part, though the branch may, and usually does in trees and shrubs, put forth fresh shoots from, or below, the point of insertion of the flower-stalk.

P. lateralis is a general term for a flower-stalk that originates from the side of a stem or branch, whether it be axillary or otherwise.

P. solitarius is either single on a plant, as in the Snowdrop, or only one in the same place, as in the Violet, Thorn-apple, and many common plants.

Pedunculi aggregati, clustered flower-stalks, are such as grow several together from one point, in whatever situation.

P. sparsi are scattered over the plant or branches, in a solitary manner.

P. uniflori, *biflori*, *triflori*, are such as bear each one, two or three flowers.

P. pauciflori bear few, *multiflori* many, flowers.

When there is no flower-stalk at all, the flowers are said to be sessile, *stipes sessiles*.

Various particulars belonging to flower-stalks may be found at INFLORESCENCE, or under various articles there indicated.

The physiology of the PEDUNCULUS is in many instances curious. Its evident use is to sustain the flower and fruit, and to transmit their requisite matter of nourishment, till the seed is perfected. Hence the part in question, though sometimes curved during the growth of the flower, that the organs of impregnation may be sheltered from rain, often becomes erect for the better support of the seed-vessel, lest the seeds should be prematurely, or too suddenly, dropped. The slender and weak stalk of a flower, not unfrequently acquires additional increase and strength, for the support of a weighty fruit. Nevertheless, when its final purpose is answered, that very stalk separates at some destined spot, where a solution of continuity spontaneously takes place, in parts originally so firmly united that no trace of disunion could be perceived.

PEE, in *Geography*. See PROME.

PEE, in *Mining*, is used for the place where two veins meet and cross one another, thus +.

PEEAYE-MEW, in *Geography*. See PROME.

PEEBLES, a royal burgh, and the county town of Peebles-shire, or Tweeddale, Scotland, is situated at the distance of twenty-one miles south from Edinburgh, at the confluence of the Eddlestone, or Peebles Water, with the Tweed. It is of great antiquity, and was probably a town even in the time of the Gadens. At all events there were

undoubtedly a considerable village, and a church here, before the commencement of the Scoto-Saxon period; "and there was here also as early, perhaps, a royal castle, with a chapel and other accommodations, which a town only can supply." This opinion derives much support from the fact, that Peebles is mentioned in the earliest Scottish records, "as a town of the royal demesne, which yielded a firm into the royal exchequer." According to Dr. Pennycuik, it was occasionally honoured by the residence of the Scottish monarchs, till the death of Alexander III., who conferred on it many special marks of his munificence and favour. In the contents for the succession to the throne which ensued, the inhabitants espoused the cause of Baliol, and were afterwards compelled to submit to the usurpation of Edward I. of England. At this period the town appears to have been governed by a bailiff; and a certain number of burgesses, as we find them mentioned to have sworn fealty to the English king at Berwick, on the 28th of August 1296. In 1304, it was granted by that prince to Adomar de Valence, the warden of Scotland, and his heirs. When it became a royal burgh, with special privileges, is uncertain; but it is known to have sent two representatives to the parliament, called in 1357 to ratify and provide the ransom of David II. This monarch afterwards granted Peebles a charter, dated September 20, 1367, in which it is styled a royal burgh; and the same was subsequently confirmed by king James II. and king James VI with additional privileges. By virtue of these charters the corporation of the town now consists of seventeen members, a provost, two bailies, a dean of guild, a treasurer, eleven counsellors, and one deacon. Its revenue is very considerable, most of the lands in the vicinity being the property of the public. These lands were granted to the borough in the year 1560, in consideration of "the loyalty, fidelity, and good services" of the inhabitants.

The town of Peebles was much more extensive formerly than at present, and occupied a somewhat different site, extending from Eddlestone Water westward, to the Meadowwell-strand. Of its buildings at this period little is known, but they were probably of a comparatively superior cast, as many of the houses were occupied by the nobility attending the court, when the monarch resided in the castle. Peebles in fact was to Edinburgh what Windsor now is with respect to London. Previous to the reformation it had three churches, besides several chapels. The high church, which was dedicated to the Virgin Mary, is supposed to have been erected in the eleventh century, on the site of some more ancient fabric. Its ruins still remain at the western extremity of the old town. This church was destroyed at the time of the reformation; when the Cross-church was converted into the parochial place of worship; and continued to be such till the present handsome structure was erected in 1784. Peebles is now divided into two parts, called the Old and New Town. The latter is situated on the eastern bank of the Peebles Water, and appears to have been strongly fortified, both by nature and by art. Over the Tweed is an ancient bridge of five arches; and there are two smaller ones over the Eddlestone, to connect the new town with the old. The chief support of the town is its manufacture of carpets, serges, and linen and cotton cloths; but it is likewise much indebted to its market, which has been long celebrated for oat-meal. The market day is on Tuesday, weekly, and there are besides seven annual fairs.

The chief remains of antiquity in Peebles, are the ruins of the Cross-church, and of that which was dedicated to St. Andrew. The former was part of the conventual church of a monastery founded, according to Bœcius Major, and others, by king Alexander III. Some say it was erected

erected on the spot where the relics of St. Nicholas the Martyr were discovered in 1261, an event which is particularly noticed by Fordun. This convent was filled with Red or Trinitarian friars, which order was instituted for the redemption of Christian slaves from the Turks; a third part of their annual income being appropriated to that purpose. Its buildings constituted a square, having the church on the southern side. This edifice measured 102 feet in length, and 32 in width, and was, as well as the houses and cloisters, entirely built with whin-stone, except the angles, doors, windows, cornices, &c. which were of a white free-stone. After the suppression the convent was suffered gradually to go to decay, but part of the church, as already mentioned, was fitted up for divine service, and the remainder was walled off and converted into a public school. In this state it remained till the building of the new church, when the interior was stripped of its seats and furniture, but the walls, by a praiseworthy act of council, were ordered to be protected, as a venerable monument of ancient art.

The church of St. Andrew is of greater antiquity than the Cross-church. The exact period of its construction is not recorded; but as it is stated to have been consecrated by Josceline, bishop of Glasgow, who died A.D. 1199, its date may be fixed a few years previous to that event. Judging from its remains, it seems to have been a large and capacious structure, and is certainly of great age, as all its doors and windows display semi-circular arches, or at least some segment of a circle. This church was the most ancient parish church in Peebles. After it lost that rank, in favour of the Cross-church, it was allowed to fall into ruin. A party of Cromwell's soldiers used it for some time as a stable, and at their departure demolished the roof. The only portions of this structure now standing are the square tower, and some fragments of the side walls. The church-yard is still used as a burial ground. Of the royal castle of Peebles no vestiges can be traced, but its site yet retains the name of Castle-hill. For an account of the antiquities in the vicinity, see the next article.

According to the parliamentary returns of 1811, the burgh and parish of Peebles contain 422 houses, and a population of 2485 persons.

Beauties of Scotland, vol. ii. Caledonia, vol. ii. by George Chalmers, F.R.S. and S.A. 4to. 1810.

PEEBLES-SHIRE, or TWEEDALE, one of the southern counties of Scotland, is situated between $55^{\circ} 25'$ and $55^{\circ} 50'$ of N. latitude, and from $2^{\circ} 58'$ to $3^{\circ} 34'$ of W. longitude from Greenwich. It is bounded on the south by Dumfriesshire, on the north and north-east by Edinburghshire, on the west by Lanarkshire, and on the east by the county of Selkirk. According to Armstrong's map, it measures in length from north to south about 28 miles, and varies in breadth from 10 to 18 miles; the mean length being 27 miles, and the average breadth $13\frac{1}{2}$. Of consequence, the superficial area ought to be 364 square miles, and its contents 232,960 English acres; but from a minute calculation, made by Mr. Chalmers, the real superficies is estimated at 338 square miles, or 216,320 acres; of which about 20,000 acres are arable, or under tillage. According to the parliamentary returns of 1811, this shire contains 1820 houses, and 9935 inhabitants.

General Aspect of the County.—Tweeddale, when viewed from a distance, seems to form one continued chain of mountains, and may perhaps be generally described as a mountainous country. Upon a narrow investigation, however, it is found to possess many rich and fertile vallies or straths of arable land, lying along the banks of its numerous rivers. Of these the dale of the Tweed is the principal, intersecting

the centre of the county throughout its whole extent. Hence many vales branch off, following the channels of the several streams which increase that majestic river. These, as may be conjectured, are various in size, as well as diversified in appearance. The most considerable and the most fruitful are the vallies of the Lyne and Eddlestone waters. In general, the dales and the dingles are most fertile, and the hills most pleasant in the north and west divisions of the county; while, in the south and east, the vales are more barren, and the hills more bleak.

Mountains.—The surface of Peebles-shire rises on both sides of the great central valley of the Tweed, to a very considerable elevation. The highest hills are situated towards the extremities of the county; and, indeed, those bordering on Annandale are the loftiest in southern Scotland. On the boundary with Selkirkshire, Blackhouse hills measure 2360 feet in height above the level of the German ocean; and Seamed Law, about two miles further to the north, mounts to 2120 feet above the same level. Minchmoor, on the south-east of Peebles-shire, rises 2285 feet; and Windlestraw Law, on the north-east of the county, 2295 feet above the sea. In the parish of Manor are two very high hills, called Scrape and Dollarburn, the latter of which is calculated to reach an elevation of 2840 feet. Cardon, or Cadow-hill, in the parish of Kilbucko, is about 1400 feet above the level of the Tweed, or 2200 feet above the level of the ocean. This is the highest hill on the western side of the shire, but there are many others very little inferior in altitude. In the parish of Kirkurd is a hill called Hell's Cleugh, the summit of which is distinguished by a small cairn, called the Pyked-stane, whence is a view of the county beyond the Forth, and of a chain of hills stretching from the east part of Fife, as far as Dunbartonshire. South of the Forth, the view extends as far east as North Berwick, likewise to the Eildon hills near Melrose, and Cheviot hills in Northumberland. Dundreigh, or Druids' hill, in the parish of Eddleston, also commands a most extensive and diversified prospect over Teviotdale, Annandale, Clydesdale, Perthshire, Fifeshire, and the three Lothians. This hill is computed to rise 2100 feet above the level of the ocean. Near the source of the Tweed the hills are in general extremely beautiful, being covered with grass to their very summits: some of them are of a great height, particularly Hartfield and Broadlaw, which are stated to reach the altitude of 2800 feet from the level of the Forth. Between Minchmoor and Hinderland the hills are more black, craggy, and precipitous, than in any other district of the county, and are frequently intersected by deep and tremendous chasms. One of these openings, called Grimcleugh, is upwards of half a mile in length, and not less than 300 feet in depth.

Rivers and Lakes.—The rivers of this county are numerous; but all of them, with the exception of the Megget and the North and South Esk, discharge their waters into the Tweed, as the common receiver. This celebrated river, whence the familiar name of the shire is derived, has its source on the mountainous ridge which separates Tweeddale from Annandale, and can boast of giving rise to the three first rivers in the south of Scotland: the Annan, which flows southwards into the Solway-frith; the Clyde, which runs north-west into the Clyde-frith; and the Tweed, which directs its course to the German ocean at Berwick. The last-mentioned river flows above 40 miles within the county, in a curvilinear and serpentine direction, dividing it nearly into two equal parts. Its current, particularly in that part of its course above Peebles, during which it descends from a height of 1550 feet, is extremely rapid, as indeed are all the streams in the county. The Tweed is the longest river in

PEEBLES-SHIRE.

Scotland, the distance from its source to its confluence with the ocean being upwards of 100 miles. It abounds with salmon, as well as with trout. Among the rivers which fall into it, belonging to Peebles-shire, the most considerable are the Lyne, the Eddlelton, and the Leithen, on the north; and the Manor and the Quair on the south. The Lyne rises in the northern confines of the county, at a place called Cauldstaneflap; and after a course of 21 miles, reaches the Tweed three miles above Peebles. Eddlelton water has its source from King-Seat-hill in Eddlelton parish, and joins the Tweed at the county town. Leithen water runs a course of 12 miles from Water-Head to about a mile below Inverleithen church, which derives its Celtic name from that influx, or *inver*. Manor stream originates at Foulbrig, in the southern end of Manor parish, through which it runs a course of 12 miles; and which it drains, as it courses, with other streamlets to the common channel. The Quair issues from a spring at Glendean banks, and, after watering the magnificent pleasure grounds, falls into the Tweed near the noble seat of Traquair.

The lakes in Peebles-shire are neither numerous nor extensive. The most considerable of them, the Water loch in Eddlelton parish, scarcely exceeds three quarters of a mile in length, and half a mile in breadth. It is, however, a very beautiful sheet of water, and gives birth to the South Esk, which falls into the river Forth, along with the North Esk, at Musselburgh, in Midlothian. The other lakes within the county are Gameshope loch, and Slipperfield loch; the former of which occupies an uninhabited glen in Tweedsmuir parish, and is emptied by Gameshope rivulet, one of the sources of the Talla water. St. Mary loch, though it bounds this county for more than a mile, and is hence claimed by some Peebles-shire topographers, is, properly speaking, a Selkirkshire lake, as it extends several miles into that county. The Megget pours its waters into this lake, whence they pass on to the Yarrow and the Ettrick, two of the most celebrated rivers in Scottish song.

Mineral Products.—Peebles-shire, as the mountainous nature of its surface would promise, is fertile in minerals. If credit may be given to our ancient historians, Boece and Buchanan, gold was formerly found in Glen-Gaber water, which traverses the parish of Megget. In Lead-Law, a hill above Linton, several lead mines were formerly wrought, which also produced a considerable supply of silver. The sinks of these mines are still apparent, and are distinguished by the appropriate name of Silver-holes. About 60 years ago they were again tried, but the attempt proved unsuccessful; the quantity of ore obtained being scarcely adequate to defray the expences of the work. In Traquair parish several attempts have been made to discover lead veins, and much ore has been found, but not sufficiently rich in silver to induce any adventurer to open mines.

A specimen of galena ore was discovered, a few years ago, in one of the streams that fall into the Quair. Coal is plentiful, particularly in the north-eastern district of the county, where limestone is also equally abundant. Beds of marle are frequent in the parishes of Linton and Newland. They are apparently formed by oozeings and springs from limestone, which encrust or petrify moss by depositions of limestone. In these beds the shells of the common snails are observed rotten and friable. Near the lime rocks of Carlops and Spittlehaugh is a bed of blue marle, of a mixed consistency between stone and clay. The prevailing stone under-stratum in the county is whinstone, but there are likewise numerous quarries of white and red freestone in different parishes. The slate quarries here have long been celebrated.

In Tramore hill, within Stobo parish, are two seams of excellent blue slate, which has been manufactured for various purposes during several years. In the lands of Lamancha there is a vast variety of clays, and in particular a very thick bed of fire clay, like the Stourbridge clay. In the same lands are many veins of iron ore; one of them is entirely grain ore, and the remainder is mixed with the same ore. Manganese is also found here, both by itself and incorporated with the iron ores; and there are likewise here some masses or beds of iron-stone, but there are no iron-works yet established. White marble, according to Penny-cuick, was formerly dug up at Whitfield, in Linton parish.

Several mineral springs are found within Peebles-shire, but none of them are particularly distinguished. North from the village of Linton is a spring, called "Heaven-aqua water," which bears some affinity to that at Tunbridge. Another spring, similar to the Harrowgate waters, appears in the parish of Inverleithen. There is also a copious sulphureous well in the parish of Kirkurd. The water here was analysed by the late celebrated Dr. Black of Edinburgh, and found to be stronger than the sulphureous water at Moffat. At Lamancha, in Newland parish, is a chalybeate spring, called the "Vertue Well," which contains a large quantity of fixed air, that holds the iron in solution.

Soil and Climate.—The prevailing soil on the haughs, or flat grounds nearest the waters, is generally a sandy loam, or a composition of fine earth deposited by the water after floods. The level land, lying a little above the haughs, is of a rich loam soil, on a gravelly, rocky, or till bottom. Near the sources of the several rivers, the soil is frequently of a mossy or moorish nature, particularly in the northern district of the county, where, as already mentioned, the land is the least elevated.

The climate of Peebles-shire is various. In the valley of the Tweed, which may be called the body of the county, it is often mild and warm, while in the higher and more remote parts the cold is extremely intense. Showers of rain are frequent, but the average quantity which falls in this county is much less than in the adjoining counties to the east and west, seldom exceeding twenty-eight inches annually. Many of the hills are covered with snow as early as the commencement of October; and in the autumn months some of the vales suffer greatly from the prevalence of hoar-frosts or frosty mists, which blast vegetation of every kind, and are especially pernicious to potatoes, clover, and peas.

Agriculture.—From the termination of the eleventh, to the beginning of the fourteenth century, the husbandry of this county is said to have been in a much more forward state than in most of the other counties in Scotland. The system, as at present, was then a mixture of farming with grazing. The four centuries which succeeded, however, were unprosperous in the highest degree; and it was not till after the union that any amelioration began to take place, and that prejudice was forced, in some measure, to yield to the influence of more rational ideas. Among those who have promoted agricultural improvement since that period, were "the far famed" Archibald, duke of Argyle, sir Alexander Murray of Stanhope, Dr. Penny-cuick, and James M'Daigal, a farmer near Linton. The exertions of the individual last mentioned were particularly useful in their consequences. He introduced the Norfolk rotation of crops, and several other practices before unknown here; and by his success in their application, roused in his neighbours a similar spirit of enterprise and improvement. Dairy farming was revived by Thomas Stevenfon; and the turnip husbandry was first attempted in 1764 by George Dalzel, innkeeper

PEEBLES-SHIRE.

inkeeper at Linton, who was likewise the first to cultivate the potatoe on an extensive plan, by the plough. But the greatest spring to the farming prosperity of the county was fixed about the year 1788, when the lord of Neidpath granted to all his tenants leases for fifty-five years, in consideration of certain fines, which his wants or his rapacity induced him to demand. The idea of property for so long a period stimulated the farmers to erect commodious houses, to make inclosures, and to lay out their capitals in various improvements. Inclosing and planting has since proceeded rapidly; and the best practices in husbandry are adopted. Oats are the favourite grain, but barley is likewise pretty extensively cultivated on the best soils. The turnip husbandry is carried on to a great extent, and has almost entirely exploded the practice of summer fallowing. Artificial grasses are raised on the arable lands in every district of the shire. These, however, bear but a small proportion, in point of extent, to the natural pasturage lands, which perhaps occupy nine-tenths of the whole area of the county, and are still chiefly appropriated to the rearing and feeding of sheep. The average extent of sheep farms here is 1500 acres; but there are many which reach so high as 3000 acres, and few fall short of 800. Each of them have a portion of arable land attached to them, some more and some less, according to their distance from the vallies. The common breed of sheep here is "the short-tailed compact-bodied sheep, with black faces and legs." The practice of smearing sheep with a mixture of tar or train oil, or Orkney butter, is still continued in this county, though the reasons alleged for the custom do not seem very satisfactory. Some say it improves the wool, but others doubt it, and think its only advantage is, that it keeps the sheep warm in winter; and certain it is that Tweedale wool is both coarse and low priced, and fit only for making carpets, shalloons, and such like articles of woollen manufacture.

Civil Government and Divisions.—Peebles-shire, like every other county in Scotland, is subjected to the jurisdiction of a lord lieutenant, and a sheriff depute, the latter of whom nominates a substitute to hold courts in his absence. When it was first elevated to the rank of a sheriffdom is not precisely fixed by record, but we find mention of two sheriffs in Tweedale, one in Traquair, and the other at Peebles, about the year 1184. These two sheriffdoms merged into one before the close of the fourteenth century, under the title of the latter, and have remained in the same condition ever since. The parishes within this shire are sixteen in number; and besides the royal burgh of Peebles, there are five very considerable villages that have markets and annual fairs for sheep, horses, and cows. These are Linton, Eddleston, Skirling, Broughton, and Inverleithen.

The situation of Inverleithen is most beautiful; and it has lately acquired some degree of activity by a woollen manufacture established there.

Roads.—The improvement in roads within the last fifty years has been very great in this county. The public roads indeed are excellent. One from Edinburgh towards Moffat traverses the whole length of the shire, from north-east to south-west. Another traverses it in like manner from west to east, from Biggar, by Peebles and Inverleithen, towards Galla-shiels and Kelfo. This road affords the means of conveying towards Glasgow all the superfluous grain of this district. A road also runs from Inverleithen towards Middleton, which supplies a great part of Peebles-shire with coal. It was made in 1794, and shortened the line of communication no less than fourteen miles.

Manufactures.—Tweedale cannot be called a manufacturing county, for though a considerable quantity of linen

is made by the inhabitants, none of it comes to sale, the whole being consumed by their own families. Woollen and cotton weavers, however, are said to be increasing about Peebles and its vicinity; where are likewise a few stocking looms. A woollen manufactory has been lately established at Inverleithen, which from its congenial situation is calculated to flourish. It is surprising that no woollen manufactory has hitherto been fixed at Linton, considering its favourable position on the turnpike road to Edinburgh, and the numerous advantages it possesses with respect to coal, lime, freestone, water, and sheep-walks.

Antiquities.—The remains of antiquity in Peebles-shire are at once numerous and various. Traces of the ancient Britons can still be discovered here in the names of places; as also in their religious, sepulchral, and military monuments. At Hairflanes, in Kirkcud parish, are the remains of a Druid temple, consisting of a number of large stones standing in a circular form. Another curious druidical temple is situated on the remarkable peninsula called Sheriffmuir. From each of two standing stones there run out to the east, in a curvature, two rows of smaller stones, which also stand upright. A third monument of a similar kind is seen near Tweedsmuir church, and a fourth, smaller one, on the borders between Peebles and Selkirk. Several tumuli or barrows are spread over Kirkcud, Glenholm, and Linton parishes. In a cairn upon King's Muir, in Peebles parish, were lately discovered an inverted urn, containing the ashes of some British warrior, with the blade of his dagger. In Eddleston parish, near the Ship-Law, there is a barrow called the "Ship-horns," because resembling the inverted hull of a ship. A number of sepulchral cairns are also discovered in the vale of the Tweed, and on Sheriffmuir. These, however, all yield in interest to the grave of Merlin, which is pointed out under a thorn tree, near the influx of Powfail with the Tweed. In that sacred spot, according to tradition, lie the remains of the prophet, to whom so many wonderful feats and predictions are attributed in the writings of the ancient bards.

In Peebles-shire are many hill-forts, undoubtedly of British construction, and several standing stones, supposed to be memorials of battles. The forts are generally of a circular shape, but sometimes deviate from that figure to suit the summit, or the ground whereon they are placed. On the hill called Cademuir are four British encampments, one of which is surrounded by a rampart of stones without cement. This rampart is in some places double; but in other parts it is single and of prodigious thickness. Janet's brae in Peebles parish is also distinguished by two entrenchments, which are each surrounded by a single ditch and vallum. In the same parish are several other similar works; particularly one on the summit of Meldum, another on the hill above Hutchinfield, a third near Hayton Craig, a fourth on the hill above Wham, and a fifth on the hill called Ew-hill-rig. In Manor parish are likewise many strengths, on Hound-hill, Caverhill, and on a small eminence called the *Ring-know*. On a height near Inverleithen, are the remains of a British fortress, which appears to have had three ramparts and ditches. The other principal British military works, are at Milkington-Rings, and North-Shield-Rings, in the parish of Eddleston; on Terrace-hill, in Newlands parish; on the rising ground above Linton, and on the top of Lead-Law. Besides these, however, there are numerous others which our limits will not permit us to particularize.

The Romans, who were unquestionably the first people that encroached upon the British aborigines, have left few traces of their residence here, and those few are confined to military posts or encampments. Of these the principal one

is situated on the eastern side of the Lyne, about ten miles to the eastward of the Watling-street, which traverses the country within half a mile of the western extremity of the shire. This entrenchment is called by the common people Randal's Walls, from a tradition that Randolph, earl of Murray, had a house within its area. According to Armstrong it contains six acres and two roods of ground, which has been frequently ploughed, when many Roman coins have been turned up. Another Roman encampment is situated on the northern side of Upper Whitfield, in the parish of Linton. It is in the form of a parallelogram, and is surrounded by a single fosse and rampart, which are now nearly obliterated. A third entrenchment, in the parish of Manor, is also generally represented to be of Roman construction.

Among the other antiquities of this county, the most prominent are its terraces and castles. Respecting the origin and uses of the former much difficulty prevails; indeed all that has been advanced concerning them is merely conjectural. The opinion of Chalmers, however, that they were intended for the accommodation of large bodies of spectators to witness some sport, carries with it considerable plausibility; and it likewise seems probable that several of them were subsequently appropriated for the administration of justice. Of such works the most considerable are those on a beautiful green mount, called Terrace-hill, above Newlands. Along the whole face of this hill there are eleven or twelve terraces, from fifteen to twenty feet broad, which rise by a regular gradation to the top. About half a mile to the north is another eminence, called "Moot Hill," which has likewise several tiers of terraces. Similar terraces are to be seen at Kirkurd, at Skirling, and at Smithfield.

The remains of the castles and fortified towers of this county, are principally seated on the banks of the Tweed, and alternately on both sides of that river, and in sight of each other, as happens in Selkirkshire and Berwickshire. The object of this arrangement was the defence of the country from the incursions of the border chiefs. On the approach of an enemy, a fire was immediately lighted on the top of the nearest castle, and thus notice of the aggression was spread over a district of at least seventy miles in length in the course of a few hours. These castles were built of stone and lime, usually in a turretted form, and for the most part occupied an eminence of difficult access. Those situated within ten miles above and below Peebles were at least twenty-six in number, and much resembled each other, except in the circumstance of greater or less magnitude. At Traquair the Scottish kings had a castle in the twelfth century, where they occasionally resided for the purpose of hunting in the forest. This castle is now completely demolished, as well as that at Peebles, which is likewise said to have been a royal residence. On Woodhill are some remains of an ancient building, which is called Macbeth's castle; and in Broughton parish is another, bearing the same name, which is traditionally said to have belonged to the celebrated Macbeth. The remains of Oliver castle, the seat of the Frasers, are seen in Tweedsmuir parish; and on Fruid water are the remains of Fruid castle, another baronial mansion, which also belonged to that powerful family. Drummelzier castle is situated close to the river Tweed, and about a mile from it is Thaness castle, or Tinnis castle, formerly occupied as a sort of redoubt by the Tweedies, the lords of Drummelzier, who dominated here during several ages of anarchy. But these, and indeed almost all the ancient castles in this shire, are completely ruinous, with the exception of that of Niedpath, in the vicinity of Peebles, which being of vast strength, still continues in tolerable preservation, and consequently affords an excellent specimen of similar building. This castle stands

on a rock, projecting over the north bank of the Tweed, which here runs through a deep narrow glen well wooded on both sides. Towards the land it commands an important pass. The walls are eleven feet in thickness, and cemented with lime almost as hard as the strong whinstone of which they are built. Niedpath was anciently the chief residence of the Frasers above-mentioned, and was most probably the birth-place of the brave sir Simon Fraser, the last of the family in the male line, who, in 1303, with only ten thousand men, repulsed and defeated the English, thirty thousand strong, in three successive battles, fought in one day on Roslyn moor. In the reign of Charles I. it was garrisoned for the king, and held out against Cromwell longer than any place in Scotland, south of the Forth. The situation of this castle is extremely beautiful and commanding. Penny-cuick, who says it was of old called the "Castle of Peebles," celebrated it thus:

"The noble Niedpath Peebles overlooks
With its fair bridge and Tweed's meand'ring brooks,
Upon a rock it proud and stately stands,
And to the fields about gives forth commands."

Caledonia, or An Account of Historical and Topographic of North Britain, by George Chalmers, F.R.S. 4to. edit. 1810. Beauties of Scotland, vol. ii. Sinclair's Statistical Account of Scotland, vols. iii. iv. xii. xvii. Armstrong's Companion to the Map of Tweedale.

PEEING-GHIE, a town of the Birman empire, situated on the Irawaddy, from which a great quantity of teak timber is carried to Rangoon. The forests extend along on the western mountains: the trees are felled in the dry season, and when the monsoon sets in are borne by the torrents to this town and Sahlhadam, a little above it. Peking-ghie is about 20 miles N.W. of Mayadoun.

PEEK, in the *Sea Language*, a term used in various senses; *e. g.* an anchor is said to be *a-peek*, when the ship, being about to weigh, comes over her anchor, so that the cable hangs perpendicularly between the hawse and the anchor; the bringing of a ship into which position they call *heaving a-peek*.

A ship is said to ride *a-peek*, when, lying with her main and fore-yards hoisted up, one end of her yards is brought down to the shrouds, and the other raised up on end; which is chiefly done when she lies at rest in rivers, lest other ships, falling foul of her, should break her yards.

PEEK, *to ride a broad*, denotes much the same, excepting that the yards here are only raised to half the height.

To PEEK the mizzen, is to put the mizzen yard perpendicular by the mast.

PEEK is a name given to the upper corner of all those sails which are extended by a gaff, or by a yard which crosses the mast obliquely, as the mizzen yard of a ship, the main yard of a bylander, &c. The upper extremity of those yards and gaffs is also called the *peek* or peak.

PEEK is also used for the room in the hold, from the bits forward to the stem: in this place men of war keep their powder, and merchantmen their victuals.

PEEK-haliards, are the ropes or tackles by which the outer end of the gaff is hoisted as opposed to the throat haliards, which are applied to the inner end.

PEEK's Hill, in *Geography*, a small post-town of America, in West Chester county, New York, on the E. side of Hudson river, and N. side of the creek of its name, five miles from its mouth; 50 miles N. of New York.

PEELAS, a small island in the Sooloo Archipelago. N. lat. 6 32'. E. long. 121 45'.

PEELE, GEORGE, in *Biography*, a dramatic writer in the

the reign of queen Elizabeth, was a native of Devonshire, and a student of Christ-church college, Oxford, where he took his degree of M.A. in 1579. He was a good pastoral poet, and his plays were acted with great applause in the university.

PEELE, in *Geography*, a small sea-port town, situated on the western coast of the Isle of Man, in the Irish channel, was formerly denominated Holm, and appears, from its remains, to have been a place of considerable importance in the times of Manish independence. The annexation of Man to the British crown, and the subsequent destruction of the smuggling trade, however, have reduced it greatly. The harbour, indeed, is now almost entirely neglected, notwithstanding it is an excellent resort for shipping, and the pier is completely destroyed. In short, this town offers to the present traveller an appearance of decayed grandeur; and is consequently more an object of interest and curiosity than inviting as a place of residence, for the man of business or of pleasure. Woods, in his account of the Isle of Man, computes the population of Peele at about twelve hundred persons. The only church in the town, now used for divine service, is that dedicated to St. Peter, but there are besides the ruins of other two dedicated to St. Patrick and St. Germain. These stand within the castle, on a small rocky island, which is separated from the western extremity of the town by a narrow channel, scarcely a foot deep at low water. This island and castle are connected with the mainland by a strong wall, shelving to the top, which was built many years ago to secure the harbour. The entrance is on the eastern side, by a flight of steps now so ruinous as to be dangerous of access. The walls of this fortress measure about four feet in thickness, and are flanked with towers; the whole inclosing a space of somewhat more than two acres of ground. Before the sale of the Royalty of Man to the British government, a garrison of troops, in the pay of the lord of the island, was stationed here; but since that event the castle has been altogether neglected, and the entire area is occupied by the ruins of various buildings, walls, and dwelling houses. About the centre of it is a square pyramidal mound of earth, terminating obtusely, and having each of its sides directed to one of the cardinal points. This tumulus is surrounded by a ditch five feet and a half broad, and is supposed either to have been an eminence whence an officer might harangue his troops, or the burial place of some great personage. Near this mound stand the ruined churches above-mentioned, both of which are of considerable antiquity. Patrick's, however, is by far the older of the two, and is probably of earlier date than the era of the Norman conquest. St. Germain's was built about the year 1245, and is the cathedral of the island, but has not, for many years, been used for any other purpose than a burying-place. Its dimensions are seventy-six feet by twenty; and beneath one part of it is the ecclesiastical prison or dungeon, where such persons were confined as were so unfortunate as to incur the spiritual censure. The length of this vault is thirty-four feet, and its breadth sixteen. The bottom is of earth, and at one corner are the remains of an uncovered well, which must have rendered the place damp in the extreme. The only light or air is admitted through a small hole in the wall.

Three miles from Peele is the Tinwald mount, where the Manx parliaments and great councils were convened, and where also the superior courts held judicial proceedings at stated periods. It is an artificial eminence of very singular appearance, and of unknown antiquity. According to some etymologists, its name is a compound of the Danish word *tin* or *ting*, signifying an assembly or meeting, and *wald*, a field or

fenced place. Several modern authors, however, derive it from the British words *tyng* and *wal*, signifying "the juridical hill." The approach to the summit of this mount is by a flight of turf steps on the eastern side. The diameter at the top is about seven feet, and three feet below it is an annular plot four feet wide, which is succeeded by another six feet broad, and this by a third still wider. The circumference of the outer circle is nearly eighty yards; all the angles are rounded, and almost the whole surface is of turf.

At a short distance from the Tinwald is a small chapel dedicated to St. John, rebuilt about fourteen years ago, after the model of the former chapel, which had fallen completely to ruin. It has no pews, never being used for divine service except on the day of the promulgation of the laws. An Account of the Past and Present State of the Isle of Man, by George Woods, 8vo. 1811.

PEELING, a town of America, in Grafton county, New Hampshire, containing 83 inhabitants.

PEEM, a town of the duchy of Holstein; 9 miles W. of Eutyn.

PEEMDAHATTA, a town of Hindoostan, in the circar of Ruttunpour; 25 miles N.N.E. of Dumdah.

PEENANG, or *Prince of Wales's Island*. See PINANG.

PEENE, a river which runs into the Baltic, W. of the island of Usedom; separating in part of its course Hinder Pomerania from Anterior Pomerania. N. lat. $54^{\circ} 10'$. E. long. $13^{\circ} 50'$.

PEENEMUNDE SCHANZ, a town and fort in the island of Usedom, which it commands, as well as the entrance and mouth of the Peene, near which it stands; 6 miles N. of Wolgast. N. lat. $54^{\circ} 10'$. E. long. $13^{\circ} 48'$.

PEENPACK, a town of New York, in Orange county; 25 miles W. of Newburgh.

PEEPAROO, a town of Bengal; 6 miles from Natore.—Also, a town of Hindoostan, in Rohilcund; 15 miles W.S.W. of Budayoon.

PEEPLY, a town of Hindoostan, in Cattaek; 5 miles S. of Cattaek.

PEER, PAR, primarily denotes an equal, or one of the same rank and condition. Hence, in some councils, or assemblies, we find, "with the consent of our peers, bishops, abbots, &c."

PEER, afterwards, was applied to the vassals, or tenants of the same lord, who were obliged to serve and attend him in his courts.

They were called peers, *pares*, because equal in function; and *peers in fees*, or *fees*, because holding fees of the lord; or because their business in court was to sit and judge, under their lord, of disputes arising concerning fees.

The number of peers required to sit in a court was at least four; and when there happened to be too many peers in the same lordship, the lord usually chose out twelve, who had the titles of peers, by way of distinction and eminence.

There are also instances of women who have assisted at judgment, on account of their tenements, not of their being wives of peers. The origin of these peers of fees is as ancient as that of the fees they were appointed to judge of: from these we derive our common juries, and our peers of the realm.

PEER of the Realm, denotes a noble lord, or person who has a seat and vote in the upper house of parliament; which is hence called the *house of peers*. See NOBILITY.

The right of peerage seems to have been originally territorial; that is, annexed to lands, honors, castles, manors, and the like; the proprietors and possessors of which were (in right of those estates) allowed to be peers of the realm,

realm, and were summoned to parliament to do suit and service to the king: and when the land was alienated, the dignity passed with it as an appendant.

Thus, the bishops sit in the house of lords, in right of succession to certain ancient baronies annexed, or supposed to be annexed, to their episcopal lands: and though they are lords of parliament, they are not properly of the degree of nobility, their blood is not ennobled, nor their peerage hereditary: and, therefore, they are tried not by peers, but by a common jury: and when one of the nobility is tried by his peers in parliament, the spiritual lords must withdraw, and make their proxies. See BISHOP.

But afterwards, when alienations became frequent, the dignity of peerage was confined to the lineage of the party ennobled, and instead of territorial, became personal. Peers are now created by writ or patent. The creation by writ, or the king's letter, is a summons to attend the house of peers, by the style or title of that barony which the king is pleased to confer; that by patent, is a royal grant to a subject of any dignity and degree of peerage. The creation by writ is the more ancient, but a man is not ennobled thereby, unless he takes his seat in the house of lords; and some are of opinion, that there must be at least two writs of summons, and a sitting in two distinct parliaments, to evidence an hereditary barony (Whitelocke of Parl. p. 114.); and, therefore, the most usual, because the surest way is to grant the dignity by patent, which enures to a man and his heirs, according to the limitation thereof, though he never makes use of it. Creation by writ, however, has one advantage over that by patent; for a person created by writ holds the dignity to him and his heirs, without any words to that purport in the writ: but in letters patent, there must be words to direct the inheritance; or else the dignity enures only to the grantee for life. For a man or woman may be created noble for their own lives, and the dignity not descend to their heirs at all, or descend only to some particular heirs; as where a peerage is limited to a man, and the heirs male of his body by Elizabeth his present lady, and not to such heirs of any former or future wife. Co. Litt. 9. 16.

Peers of the realm are by their birth hereditary counsellors of the crown, and may be called together by the king, to impart their advice in all matters of importance to the realm, either in time of parliament, or when there is no parliament in being (Co. Lit. 110.): accordingly Bracton, (l. i. c. 8.) speaking of the nobility of his time, says, they might properly be called "consules, a consulendo; reges enim tales sibi associant ad consulendum." And in our law-books (7 Rep. 34. 9 Rep. 49. 12 Rep. 96.) it is laid down, that peers are created for two reasons; "1, ad consulendum; 2, ad defendendum regem;" on which account the law gives them certain great and high privileges: such as freedom from arrests, &c. even when no parliament is sitting; because it intends, that they are always assisting the king with their counsel for the commonwealth; or keeping the realm in safety by their prowess and valour. Instances of the peers to advise the king, have been in former times very frequent; though now fallen into disuse, by reason of the more regular meetings of parliament. In cases of emergency, our princes have at several times, in a later period, thought proper to call for and consult as many of the nobility as could be easily got together; such was particularly the case with king James II., after the landing of the prince of Orange; and with the prince of Orange himself, before he summoned that convention parliament, which afterwards called him to the throne. Besides, it is usually considered as the right of each particular peer of the realm to de-

mand an audience of the king, and to lay before him, with decency and respect, such matters as he shall judge of importance to the public weal. The claims of peerage may be hereafter easily settled, since by a standing order of the house of lords, May 1767, the heralds are directed to take exact accounts, and preserve regular entries of all peers and peeresses of England, and their respective descendants; and it is required that an exact pedigree of each peer and his family, shall, on the day of his first admission, be delivered to the house by Garter, the principal king at arms.

As to the privileges of peers, see NOBILITY and PARLIAMENT. See also CLERGY, *Benefit of*.

The house of lords have a right to take cognizances originally of all public accounts, and to enquire into any misapplication, or default in the distribution of public monies; or of any other mismanagement whatsoever.

Towards the latter end of the reign of king Charles I., the house of lords asserted their jurisdiction of hearing appeals from the chancery, which they do upon a paper petition, without any writ directed from the king; and for this their foundation is, that they are the great court of the king, and that therefore the chancery is derived out of it, and by consequence that a petition will bring the cause and record before them. This was much controverted by the commons in the reign of Charles II., but is now pretty well submitted to, because it has been thought too much, that the chancellor should bind the whole property of the kingdom without appeal.

PEERS, *Pairs of France*, were, before the revolution, the twelve grand lords of that kingdom. The institution of these peers is very uncertain; some refer it to Hugh Capet, at the time when the dukes and counts changed the offices they then held of the king into perpetual fiefs: but this is impossible; Champagne, one of the titles, not being then erected into a county. Indeed, Pasquier observes, that it is an old tradition, that there have been twelve peers in all ages. Of these peers, six were dukes, and six counts, *comtes*; of these, again, six were ecclesiastics, and six laymen.

The archbishops of Rheims and the bishops of Laon, and Langres, were dukes and peers; and the bishops of Noyons, Chalons on the Marne, and Beauvais, were counts and peers.

The dukes of Burgundy, Normandy, and Aquitaine, were lay peers and dukes; and the counts of Flanders, Champagne, and Thoulouze, lay peers and counts.

These lay peers assisted at the coronation of the kings in ceremony, and by way of representatives; where each performed the functions attached to his respective dignity: though their peerships were in reality all, except that of Flanders, reunited to the crown. Six lords of the first quality were chosen to represent them. The ecclesiastical peers usually assisted in person. At a later period, the title peer, in France, was bestowed, as in England, on every lord, or person, whose fee was erected into a lordship or peership.

The word peer, according to Pasquier, is derived from *patricius*, the first dignity in the eastern empire; on the model whereof he supposes these peers to have been instituted. But others, with more probability, derive the title from the *pares curie*, or *peers of fees*, because of their being equal to each other.

These *pares curie*, on whose model they suppose the peers of realms to have been erected, were a kind of vassals, depending all on the same lord, whom they were obliged to attend and assist in court.

All feudal matters, or disputes, among vassals, relating to their fees or dependencies, were terminated by the superior

rior lord of the two contending parties, and by their peers in fee.

If the procefs were between the lord and the vassal, the lord took no cognizance of it, and the peers alone judged it.

Hence all lords or nobles, being *pares nobilitate, i. e.* all equally intitled to the privileges of nobility, are denominated *pares regni, peers of the realm.*

Some authors attribute the first institution of peers of the realm to Charlemagne, but with little probability; since most of the siefs, which bear the names of duchies, &c. or give titles to the peers, were not erected into duchies, &c. till long after: the dukes, &c. in those days, being no more than simple governors of provinces, without any other title or privileges.

The more probable opinion is, that peers were first instituted by Philip the Young of France, about the year 1179, and that they first acted in capacity of peers at the coronation of his son.

PEER, in *Building.* See PIER.

PEER, in *Geography,* a town of France, in the department of the Lower Meuse, and chief place of a canton, in the district of Hasselt; 30 miles N. of Liege. The place contains 1005, and the canton 5351 inhabitants, on a territory of $187\frac{1}{2}$ kilometres, in 8 communes.—Also, a small island in the East Indian sea. S. lat. $5^{\circ} 18'$. E. long $118^{\circ} 20'$.

PEERAGE, the dignity of a peer attached to a duchy, earldom, barony, or the like.

The king of England confers peerage at pleasure. King George I. offered his parliament to resign that branch of his prerogative, and to have the number of peers limited.

The reason insisted on, was the inconvenience accruing to the state from an arbitrary and immoderate use thereof; the prince having it in his power to throw what number of his creatures he pleases into the upper house of parliament.

The twelve peers created at once in the reign of queen Anne, was a main argument in behalf of the peerage bill. But though a bill for this purpose passed the house of lords, it miscarried in the house of commons, whose leading members were then desirous to keep the avenues to the other house as open and easy as possible. It is recorded as a saying of king Charles, that if his friends could but secure him a house of commons, he would put his whole troop of guards into the upper house, but he would have the peers.

PEERAGE, to hold land in, in the *Ancient Customs,* was a tenure which obliged the person to assist the lord's bailiff in his judgments; as all the ancient vassals, called peers, did.

PEERESS. As we have noblemen of several ranks, so we may have noblewomen, and these may be by creation, descent, or marriage; and first, king Henry VIII. made Anne Bullen marchioness of Pembroke; king James I. created the lady Compton, wife to sir Thomas Compton, countess of Buckingham, in the life-time of her husband, without any addition of honour to him; and also the same king made the lady Finch viscountess of Maidstone, and afterwards countess of Winchelsea, to her and the heirs of her body: and king George I. made the lady Schulenberg duchess of Kendal.

A woman noble by creation or descent, marrying one under the degree of nobility, still remaineth noble, but if she be noble by marriage only, she loseth her dignity if she marry afterward a commoner; though not if the second husband is noble, and inferior in dignity to the first husband;

and by the courtesy of England, women noble by marriage, always retain their nobility. 1 Inst. 16. 1 Inst. 50. 6 Rep. 53

A countess or baroness (either in her own right, or by marriage) may not be arrested for debt or trespass; for though, in respect of their sex, they cannot sit in parliament, they are nevertheless peers of the realm, and shall be tried by their peers, &c. 20 Hen. VI. c. 9.

PEERGAOW, in *Geography,* a town of Hindoostan, in Dowlatabad; 35 miles S. of Amednagar.

PEERGOTCHY, a town of Bengal; 28 miles W. of Dinagepour.

PEERGUNGE, a town of Bengal; 39 miles N.E. of Purneah.

PEERNAGUR, a town of Hindoostan, in Oude; 17 miles of Manickpour.

PEERPAR, a town of Bengal; 5 miles N. of Rajamal.

PEER-PUNCHEL, mountains which form the southern boundary of Cachemire.

PEERWALTH, a town of Austria; 13 miles S. of Ips.

PEESKEN, a town of Prussian Pomerelia; 17 miles S.S.W. of Marienburg.

PEEVIT, or PEWIT, in *Ornithology,* a bird of the larus kind, with a black head, and a grey-coloured body. See *Larus Ridibundus.*

PEGANELÆON, a word used by the ancients to express oil, in which the leaves and flowers of rue had been infused and insolated.

PEGANERON, a name given by some old authors to a plaster in which rue was a principal ingredient, from *peganon,* the Greek name of rue.

PEGANUM, in *Botany,* a Greek name adopted by Linnæus for this genus, on account of its affinity to Rue; (see *RUTA.*) Πηγανον is the general name for Rue in Dioscorides; and this very plant, which is the *Harmel* of the Arabians, and thence called *Harmala* by some of the earlier modern botanists, is the Πηγανον αγριον, or Wild Rue, of that old Greek writer.—Linn. Gen. 239. Schreb. 322. Willd. Sp. Pl. v. 2. 856. Mart. Mill. Dict. v. 3. Sm. Prodr. Fl. Græc. Sibth v. 1. 319. Ait. Hort. Kew. ed. 2. v. 3. 146. Juss. 297. Lamarck Illustr. t. 401. Gærtn. t. 95. (Harmala; Tournef. t. 133.)—Class and order, *Dodecandria Monogynia.* Nat. Ord. *Multifloræ,* Linn. *Rutaceæ,* Juss.

Gen. Ch. *Cal.* Perianth inferior, of five linear, straight, acute, permanent, often toothed leaves, the length of the corolla. *Cor.* Petals five, oblong-ovate, slightly spreading. *Stam.* Filaments fifteen, awl-shaped, not half so long as the corolla, dilated at the base into a cup-like nectary under the germen; anthers oblong, terminal, erect. *Pist.* Germen roundish, three-lobed, elevated on a short stalk; style thread-shaped, erect, equal to the stamens; stigma oblong, triangular. *Peric.* Capsule roundish, with three blunt angles, of three cells and three valves, with partitions from the centre of each valve. *Seeds* several, obovate, acute, roughish.

Ess. Ch. Petals five. Calyx of five leaves. Capsule with three cells and three valves; the partitions contrary to the valves. Seed many.

Obs. Linnæus remarks that *Peganum* differs from *Ruta* as *Celastrus* from *Euonymus*; whatever is deducted in number from the pistil, being added to the stamens, and *vice versa.*

1. *P. Harmala.* Syrian Rue. Linn. Sp. Pl. 638. Bulliard Herb. de la Fr. t. 343. Sm. Fl. Græc. Sibth.

t. 456, unpublished. (Harmala; Ger. em. 1255. *Ruta sylvestris*, armala; Matth. Valgr. v. 2. 97.)—Leaves many-cleft. Stem herbaceous.—Native of open sandy heaths in Portugal, Spain, and various parts of the Levant. The dreary plains which separate France and Spain, beyond the Pyrenees, are clothed for the most part with this plant, far as the eye can reach. It is hardy with us, but not common, flowering in July and August. The root is perennial. *Herb* very bushy, repeatedly branched and leafy, of a glaucous hue, smooth. *Leaves* scattered, sessile, deeply three-cleft, pinnatifid, in linear, acute, entire segments. *Flowers* terminal, solitary, about an inch wide. *Calyx* widely spreading or deflexed while in flower, then erect; its leaves sometimes, but not always, three-cleft. *Petals* white, with green streaks. *Antbers* yellow. The whole plant has a strong scent, and bitter acrid flavour, of the rue kind.

2. *P. crithmifolium*. Retz. Obs. fasc. 3. 34. Willd. n. 2.—Leaves many-cleft. Stem shrubby.—Gathered near the Caspian sea, by Pallas, who sent seeds to Retzius. The latter distinguishes this, as a species, from *P. Harmala*, on account of its shrubby perennial stem, which is three or four feet high, whereas the other is scarcely half so tall, and the smaller size of its flowers. As to the calyx, whose leaves he says are divided in the *Harmala*, this is but rarely the case, and chiefly, as it seems to us, in garden specimens.

3. *P. retusum*, Forsk. Ægypt-Arab. 211. Vahl. Symb. v. 3. 63. Willd. n. 3.—Leaves wedge-shaped, abrupt. Stem shrubby.—Gathered by Forskall in Egypt, near Alexandria. The Arabians call it *Gharghed*.—This is a shrub, with spinous downy branches. *Leaves* sessile, somewhat fleshy, wedge-shaped, undivided, abrupt. We have seen no specimen, nor figure.

4. *P. dauricum*. Linn. Sp. Pl. 638. (*Harmala montana*, daurica, perennis, multicaulis, polygalæ folio, albo flore; Amm. Ruth. 70. *Ruta foliis simplicibus alternis*; Gmel. Sib. v. 4. 176. t. 68. f. 1.)—Leaves lanceolate, slightly crenate. Stem herbaceous.—Native of gravelly places in Siberia.—We have a wild specimen from the barons d'Itzenplitz. This has a thick, woody, perennial root. *Stems* numerous, erect, slender, mostly simple, leafy, round, smooth, scarcely a foot high. *Leaves* scattered, sessile, lanceolate, acute, half an inch long, slightly crenate towards the end, glaucous, besprinkled with glandular dots. *Flowers* few, somewhat corymbose, at the summit of each stem, white, not half the size of the first species, and differing widely from that in the form of the calyx-leaves, which are very short and ovate. The capsule is described by Ammann as of three, rarely four, cells, with two or three seeds in each.

Linnaeus seems to have been led by Gmelin's plate to suppose this had no calyx, and therefore he says, in the short generic character, "calyx five-leaved, or none," which Willdenow copies. The calyx however, though small, is present, and resembles in shape, though not in hairiness, that of *Ruta fruticulosa*, Labill. Syr. fasc. 1. t. 4. Willd. Sp. Pl. v. 2. 545, to which *P. dauricum* has a considerable general resemblance. The plants nevertheless are specifically, and as it appears by Labillardiere's figure of the fruit, generically, distinct.

Harmala montana, polygalæ foliis, floribus luteis; Amm. Ruth. 71, is thought by that author to be a mere variety of *P. dauricum*, with yellow flowers. To us it seems to merit further enquiry. May it not be still nearer akin to the *Ruta fruticulosa*, as the flowers of that are yellow? They cannot indeed be the same; as Ammann's plant, by the description of the fruit, is a true *Peganum*.

PEGASUS, in *Astronomy*, the name of a constellation of the northern hemisphere, figured in form of a flying horse. The stars in this constellation, in Ptolemy's Catalogue, are twenty, in Tycho's nineteen, in Hevelius's thirty-eight, in the Britannic Catalogue eighty-nine. See CONSTELLATION.

PEGASUS, in *Ichthyology*, a genus of fishes of the order Branchiostegous, according to the Linnæan system, but of the Cartilaginous order in more modern arrangements. The generic character is this: the mouth is beneath; the snout retractile; the upper jaw is elongated, denticulate, ensiform, and linear; aperture of the gills single, before the pectoral fins; body compressed downwards, articulate with bony incisions, and mailed; ventral fins behind the pectoral. There are three species, which are all natives of the Indian seas, and which are characterized by the shape of the snout.

Species.

DRACONIS. This species has a conical snout; it is a small fish, three or four inches in length, and is remarkable for the size of its pectoral fins, which are supposed to enable it, like the exocoeti, and some other fishes, to support itself for a few seconds in the air, while it springs occasionally over the surface of the water. The thorax, or superior part of the body, is of a broad, slightly flattened, squarish form, and is marked, both above and beneath by several radiated shields, or bony tubercles of considerable size; from each side of the abdomen springs a lengthened cirrus, which may be considered as supplying the place of a ventral fin; from the thorax the body suddenly decreases in diameter, and is marked into several divisions or transverse segments; the tail is small and slightly rounded; the pectoral fins are, as it has been already observed, large in proportion to the size of the animal, and of a rounder shape, with a kind of scalloped or indented outline; the eyes are large and protuberant, and the snout of a subconical form, but with a slight dilatation towards the tip, so as to appear spatule-shaped when viewed from above; the colour of the whole animal is whitish, with a slight cast of pale brown.

VOLANS. Snout ensiform, and denticulate. The length of this fish is about three inches; the snout is much elongated, flattened, rounded, and slightly dilated at the tip; marked by a longitudinal channel, and crenated or denticulated on the edges; on the head is a rhomboidal depression, and behind it are two deep sub-pentagonal cavities; the last joints of the body next the tail are pointed on each side.

NATANS. The snout of this species is ensiform and unarmed. It is about the length of the Volans, but much more slender: in respect to colour it is yellowish-brown, whitish beneath; snout slender, slightly dilated and rounded at the tip; marked above and beneath by a middle furrow; pectoral fins rounded and of a moderate size; the dorsal fin is situated on the middle of the back; segments of the abdomen about eleven or twelve in number; the tail is small and slightly rounded; the ventral cirri slender and flexible.

PEGASUS, in *Mythology*, a winged horse, whose origin is thus related by Hesiod: Perseus, it is said, cut off the head of Medusa, one of the Gorgons, and from the blood that issued from it sprung the hero Chrysaor, and the horse Pegasus: Chrysaor derived his name from a golden sword which he had in his hand at his birth. He fell afterwards in love with Callirhoe, the daughter of the Ocean, and had by her Geryon, the famous giant with three heads. Pegasus was so named, because he was born near the sources

of the ocean: he instantly left the earth, and winged his way to the mansions of the gods. There he now resides, in the palace of Jupiter himself, whose thunder and lightning he bears. According to Pindar, the horse Pegasus, who is represented by Hesiod as having taken flight to the mansions of the gods, was afterwards broke by Minerva, and given to Bellerophon, who mounted him to combat the Chimæra; but that hero having attempted to ascend to heaven on the wings of that horse, was thrown down to the earth, and Pegasus was placed among the stars. Ovid, among other fictions, says, that Pegasus, flying through the airy regions, went into Mauritania, where he transformed Atlas, who had given him a bad reception, into that mountain which has since borne his name. From thence, continues he, he went into Ethiopia, where he rescued Andromeda from the monster that was ready to devour her, and punished Phineus his rival, together with all those who had sided with him, by shewing them the Gorgon's head, which turned them all into stones. For an explanation of the fable of the Gorgons, see GORGONS. Under that article the reader will find that the three Gorgons were ships, called by the names which they bore, that Perseus's expedition was a sea voyage, and that Pegasus was a ship with sails, which Perseus carried into Greece, after having made use of it to rescue Andromeda. Virgil gives the epithet nine wings to a ship, "remigio alarum." If Hesiod, and after him the other poets, say that Pegasus sprung from the blood of Medusa, the reason is, says Banier, that Perseus did not carry off the ship which was so called, till after a sharp engagement, in which much blood was shed. Pegasus was, in a manner, the offspring of that Gorgon, because he belonged to her father Phorcys' fleet. When Pausanias says that Pegasus was broke by Minerva, we may suppose him to mean, that Perseus found occasion for a great share of prudence in managing to advantage a ship with sails, the use of which was then unknown to him. If, according to Ovid, Perseus mounted Pegasus for his Mauritanian expedition, it is unnecessary to say that it was meant of a ship, and not of a horse. It may however be alleged, that, according to Hesiod, Pegasus, as soon as he was born, left the earth and flew away to the mansions of the gods. A plausible meaning may be given to this circumstance by saying that Perseus, upon his return into Greece, as an acknowledgment to the gods for his happy voyage, consecrated the prow of the ship Pegasus in Jupiter's temple, according to usual custom; and if this temple stood upon mount Olympus, which was accounted heaven, and the mansion of the immortal gods, nothing more would be wanting for developing this part of the fable. As for the poets that are later than Hesiod, who make Pegasus to have taken flight upon mount Parnassus, where, with a blow of his foot, he made the fountain Hippocrene to spring up, and which became so famous afterwards for the feat of Apollo and the Muses, we may suppose, that Perseus consecrated likewise in the temple of Apollo, which was in that mountain, some other part of his ship. Chrysaor, who issued at the same time with Pegasus from the blood of Medusa, with a golden sword in his hand, was some ingenious artist who wrought in gold and ivory; an explanation corresponding both to his name and the sword in his hand. Phorcys employed him to work the elephants' teeth, and the horns of the other animals which his ships brought home; and the meaning of his marrying the beautiful Calirrhoe was, that Phorcys, in order to engage so great an artist to remain in his dominions, procured for him a considerable match. Banier's Mythology, vol. iii.

VOL. XXVI.

PEGASUS, in *Ornithology*, the grey-bellied humming-bird of Latham, a species of *Trochilus*, which see.

PEGAU, in *Geography*, a town of Saxony, in the circle of Leipzig, on the Elster, containing two churches and a convent; 10 miles S.S.W. of Leipzig. N. lat. 51° 12'. E. long. 12 12'.—Also, a town of Lower Stiria; seven miles N. of Gratz.

PEGERSK, a town of Russia, in the government of Pskov, near the lake Tchudskoe; 20 miles W.N.W. of Pskov. N. lat. 57° 55'. E. long. 27° 32'.

PEGMA, among the Romans, a wooden machine, used in theatrical entertainments, which was raised and let down by secret engines, whence it was said to grow. See PEGMATES.

PEGMATES, or rather PEGMARES, in *Antiquity*, a name given to certain gladiators, as well as artificers among the Romans.

The ancients sometimes exhibited shows of a sort of moving machine, called *pegmata*: these were scaffolds variously adorned, somewhat after the manner of those now raised for fire-works.

These scaffolds, being made to play, and rise aloft, either threw up into the air the matters with which they were charged; and, among the rest, men, who were thus sacrificed to afford the people diversion; or else they precipitated them into holes dug in the ground, where they lighted their funeral piles; or finally into the dens of wild beasts.

Both the miserable people thus sacrificed, and the workmen that made and played the machines, were called *pegmates*, or *pegmares*.

According to Casaubon, fire was set to the scaffold: and the pegmates were to save themselves through the flames, and the wreck of the machine.

Lipsius only says, that the pegmates were such gladiators as fought on scaffolds erected for that purpose. They were also called *petauriske*, q. d. *fliers in the air*.

PEGNA COVA, in *Geography*, a town of Portugal, in the province of Beira; seven miles N.E. of Coimbra.

PEGNA *da Francia*, a town of Spain, in the province of Leon, anciently called Lancia; 24 miles S.S.E. of Ciudad Rodrigo.

PEGNA *Garcia*, a town of Portugal, in Beira, on the confines of Spain; 26 miles E. of Castel Branco. N. lat. 39° 50'. W. long. 6° 39'.

PEGNA *Macor*, a fortified town of Portugal, in Beira, on the confines of Spain, containing three churches, a convent, and hospital, and about 2000 houses; 30 miles N.E. of Castel Branco. N. lat. 39° 59'. W. long. 6° 40'.

PEGNA *Mayor*, a town of Spain, in Galicia; 12 miles E.S.E. of Lugo.

PEGNAFEL, a town of Spain, in Old Castile, situated at the foot of a mountain, and defended with a castle; 25 miles S.E. of Valladolid.

PEGNA-FIRMA, a town on the W. coast of Portugal, at the mouth of the river Mongole; nine miles S. of Peniche.

PEGNAFLOR, a town of Spain, in Aituria, on the W. side of the Pravia; seven miles N.W. of Oviedo.—Also, a town of Spain, in the province of Cordova, on the Guadalquivir; 32 miles S.W. of Cordova.

PEGNARANDA, a town of Spain, in Old Castile; 18 miles W. of Osma.—Also, a town of Spain, in the province of Leon; 30 miles S.E. of Salamanca.

PEGNITZ, a river of Germany, which runs into the Rednitz, at Furth.—Also, a town of Germany, in the principality of Culmbach; on a river of the same name; 10 miles S. of Bayreuth. N. lat. 49° 45'. E. long. 11 33'.

PEGOMANTIA, Πηγομαντία, in *Antiquity*, a species of divination, which was performed with fountain water, by throwing into it a kind of dice. When they sunk to the bottom they drew happy presages; but if they remained on the surface of the water, it was a bad omen. See HYDROMANCY.

PEGONGMEW, in *Geography*. See PAGAIM.

PEGORELLA, in *Ichthyology*, a name by which some have called a fish of the truttaceous kind, caught in the Mediterranean, and more usually called *callarias*; which is a species of *Gadus*.

PEGUE, or BAGOO, in *Geography*, a country of Asia, the southern part of which was the Golden Chersonese of the ancients, is bounded on the N. by Arracan and Ava, on the E. and S. by Siam and the sea, and on the W. by part of Arracan and the bay of Bengal. This country occupies the sea-coast as far as Martaban; Prome and its northern frontier and Siam subjoined on the east. It is for the most part a level country, surrounded by mountains, which serve as a frontier on the land side, but towards the sea it is liable to invasion, and also in its interior parts by means of the rivers which pass through the mountains. These rivers, the chief of which are that of Pegu (or Syriam), and that of Ava (or Irrawaddy), so called from the capitals situated on their banks, still continue to roll down particles of gold; and it is probable, that their sands must in ancient time have yielded this precious metal in greater abundance. Hence it is not unlikely that the practice of gilding the roofs and spires of temples and palaces may have been derived from a remote period, more especially as we are informed, that Shoemadoo was built about 500 years before the Christian era, and this splendid appearance might naturally give rise to the classical appellation of the country. We learn from colonel Symes, that gold is discovered in the sandy beds of streams which descend from the mountains. Between the Keen Duam and the Irrawaddy to the northward, there is a small river called Sho Lien Kioup, or the stream of golden sand. The air of this kingdom is very healthy; the soil is very rich, and productive of corn, fruit, and roots; and it produces various kinds of timber, particularly the teak. The animals that principally abound in Pegu are elephants. Besides the mines of the richer metals which are found in this country, it abounds with inferior minerals. But the most singular product of Pegu is the ruby, which is found in a mountain between Syriam and Pegu, and which exceeds in value that of any other country. The gem called the Syriam is also found only in Pegu. But for a further account of the productions and inhabitants of this country, as well as of the various revolutions which it has undergone, we refer to the article BIRMAN empire. See also ARRACAN and AVA.

PEGUE, a city of Asia, and formerly capital of the kingdom of the same name, distant by water from Rangoon about 90 miles, mostly in a northward direction, but on account of the windings of the river, by land in a straight line much less. This city, in the year 1600, was one of the most splendid, large, and populous, in the whole of Asia; and is described by those who saw it in its prosperity as spacious, beautiful, and strong, surrounded with stone walls and very wide ditches. The extent of the ancient city may still be accurately traced by the ruins of the ditch and wall that encompassed it; from these it appears to have been a quadrangle, each side measuring nearly one mile and a half; the ditch, which was once no contemptible defence, is about 60 yards, and its depth 10 or 12 feet. The fragments of the wall evince that it was a large and laborious structure,

about 30 feet high, and at the base not less than 40 feet broad, composed of brick, badly cemented with clay mortar. Small equidistant bastions, about 300 yards asunder, are still discoverable, and there had been a parapet of masonry; but in its present ruinous state, it is so covered with weeds and briars, as to exhibit very imperfect vestiges of its former strength. In the centre of each face of the fort, there was a gateway about 30 feet wide; and these gateways were the principal entrances. The passage across the ditch is over a causeway raised on a mound of earth, that serves as a bridge, and was formerly defended by a retrenchment, of which there are now no traces. It is impossible to conceive, says colonel Symes, a more striking picture of fallen grandeur, and the desolating hand of war, than the inside of these walls displays. Alompra, when he got possession of the city in the year 1757, razed every dwelling to the ground, and dispersed or led into captivity all the inhabitants. The temples, or praws, which are very numerous, were the only buildings that escaped the fury of the conqueror; and of these the great pyramid of Shoemadoo has alone been revered and kept in repair. The present king of the Birmans has abrogated some severe penal laws imposed by his predecessors upon the Taliens, or native Peguers; and the only distinction subsisting at present between a Birman and a Talien, consists in the exclusion of the latter from places of public trust and power. Nothing has contributed more to reconcile the Peguers to the Birman yoke, than the restoration of their ancient place of abode, and the preservation and embellishment of the temple of Shoemadoo. Accordingly the king some time ago issued orders to rebuild Pegue, encouraged settlers by grants of ground, and invited the scattered families of former inhabitants to return and repeople their deserted city. His Birman majesty, on the death of the late Maywoon, or viceroy, directed his successor, the present governor, to quit Rangoon, and to make Pegue the place of his future residence, and the seat of provincial government of the 32 districts of Henzawuddy, the Sanscrit name given by the Birmans to the province of Pegu. The success of these measures has been such, that a new town has been built within the site of the ancient city; but Rangoon possesses so many advantages over Pegu, in a commercial point of view, that persons of property in business, will not easily be prevailed upon to leave one of the finest seaports in the world, to encounter the difficulties of a new settlement, where commerce, if any can subsist, must be very confined for the want of commodious navigation. The present inhabitants who have been induced to return, consist chiefly of Rhahaans, or priests, and poor Talien families, who were glad to gain a settlement in their once magnificent metropolis. Their number all together does not, perhaps, exceed six or seven thousand; those who dwell in Pegu, during its former days of splendour, are now nearly extinct, and their descendants and relatives scattered over the provinces of Tongho, Martaban, and Talowmeou; and many also live under the protection of the Siamese. It is apprehended, however, that respect for their favourite temple of worship, and the encouragement, as well as security, held out to those who venture to return, will, in time, accomplish the wife and humane intentions of the Birman monarch.

Pegue, in its renovated and contracted state, seems to be built on the plan of the former city, and occupies about one half of its area. It is fenced round by a stockade from ten to twelve feet high; on the north and east sides it borders on the old wall. The plane of the town is not yet filled with houses, but a number of new ones are building. There is one main street running east and west, crossed at right angles

by two smaller streets not yet finished. At each extremity of the principal street, there is a gate in the stockade, which is shut early in the evening; and after that time entrance during the night is confined to a wicket. Each of these gates is defended by a wretched piece of ordnance, and a few musqueteers, who never post sentinels, and are usually asleep in an adjoining shed. There are two inferior gates on the north and south side of the stockade. The streets of Pegue are spacious.

The new town is well paved with brick, which the ruins of the old plentifully supply; and on each side of the way there is a drain to carry off the water. The houses of the meanest peasants of Pegue, and throughout the Birman empire, possess manifest advantage over Indian dwellings, by being raised from the ground either on wooden posts or bamboos, according to the size of the building. The kioums or monasteries of the Rhahaans, and the habitations of the higher ranks, are usually elevated six or eight, those of the lower classes from two to four feet.

There are no brick buildings either in Pegue or Rangoon, except such as belong to the king, or are dedicated to their divinity Gaudma: his majesty having prohibited the use of brick or stone in private buildings, from the apprehension, as we were informed, (says Col. Symes,) that if people got leave to build brick houses, they might erect brick fortifications, dangerous to the security of the state. The houses, therefore, are all made of mats, or sheathing boards, supported on bamboos or posts; but from their being composed of such combustible materials, the inhabitants are under continual dread of fire, against which they take every precaution. The roofs are lightly covered, and at each door stands a long bamboo, with an iron hook at the end, to pull down the thatch: there is also another pole, with a grating of iron at the extremity, about three feet square, to suppress flame by pressure. Almost every house has earthen pots, filled with water, on the roof: and a particular class of people, whose business it is to prevent and extinguish fires, perambulate the streets during the night.

These people are called Pagwaat; they are slaves of government; men who have been found guilty of theft, and, through mercy, had their lives spared. They are distinguished by a black circle on each cheek, caused by gunpowder and punctuation; as well as by having on their breast, in Birman characters, the word *thief*, and the name of the article stolen, as, on one that we asked to be explained to us, Putchoo Khoo, *cloth thief*. These men patrol the streets at night, to put out all fires and lights after a certain hour. They act as constables, and are the public executioners.

The Maywoon's habitation, though not at all a magnificent mansion for the representative of royalty, is, notwithstanding, a building of much respectability, compared to the other houses of Pegue. From an outside view, we judged it to be roomy, and to contain several apartments, exclusive of that in which he gives audience: it possesses, however, but few ornaments. Gilding is forbidden to all subjects of the Birman empire; liberty even to lacker and paint the pillars of their houses is granted to very few: the naked wood gave an unfinished appearance to the dwelling of the Maywoon, which, in other respects, seemed well adapted for the accommodation of a Birman family.

The object in Pegue that most attracts and most merits notice, is the noble edifice of Shoemadoo, or the Golden Supreme. This extraordinary pile of buildings is erected on a double terrace, one raised upon another. The lower and greater terrace is about ten feet above the natural level of the ground, forming an exact parallelogram: the upper and lesser terrace is similar in shape, and rises about twenty

feet above the lower terrace, or thirty above the level of the country. We judged a side of the lower terrace to be 1391 feet; of the upper, 684. The walls that sustained the sides of the terrace, both upper and lower, are in a ruinous state; they were formerly covered with plaster, wrought into various figures; the area of the lower is strewed with the fragments of small decayed buildings, but the upper is kept free from filth, and is in tolerably good order. There is reason to conclude that this building and the fortrefs are coeval, as the earth of which the terraces are composed appears to have been taken from the ditch; there being no other excavation in the city, or in its neighbourhood, that could have afforded a tenth part of the quantity.

The terraces are ascended by flights of stone steps, which are now broken and neglected. On each side are dwellings of the Rhahaans, raised on timbers four or five feet from the ground; these houses consist only of a large hall; the wooden pillars that support them are turned with neatness; the roofs are covered with tiles, and the sides are made of boards; and there are a number of bare benches in every house, on which the Rhahaans sleep; but we saw no other furniture.

Shoemadoo is a pyramidal building, composed of brick and mortar, without excavation or aperture of any fort; octagonal at the base, and spiral at top; each side of the base measures 162 feet; this immense breadth diminishes abruptly, and a similar binding has not unaptly been compared in shape to a large speaking trumpet.

Six feet from the ground there is a wide projection that surrounds the base, on the plane of which are fifty-seven small spires of equal size, and equidistant; one of them measured twenty-seven feet in height, and forty in circumference at the bottom. On a higher ledge there is another row, consisting of fifty-three spires of similar shape and measurement.

A great variety of mouldings encircle the building; and ornaments somewhat resembling the fleur-de-lis surround the lower part of the spire; circular mouldings likewise girt it to a considerable height, above which there are ornaments in stucco not unlike the leaves of a Corinthian capital; and the whole is crowned by a *tee*, or umbrella, of open iron-work, from which rises a rod with a gilded pennant.

The tee or umbrella is to be seen on every sacred building that is of a spiral form: the raising and consecration of this last and indispensable appendage, is an act of high religious solemnity, and a season of festivity and relaxation. The present king bestowed the tee that covers Shoemadoo. It was made at the capital; and many of the principal nobility came down from Ummerapoora to be present at the ceremony of its elevation.

The circumference of the tee is fifty-six feet; it rests on an iron axis fixed in the building, and is farther secured by large chains strongly rivetted to the spire. Round the lower rim of the tee are appended a number of bells, which, agitated by the wind, make a continual jingling.

The tee is gilt, and it is said to be the intention of the king to gild the whole of the spire. All the lesser pagodas are ornamented with proportionable umbrellas of similar workmanship, which are likewise encircled by small bells.

The extreme height of the edifice, from the level of the country, is 361 feet, and above the interior terrace, 331 feet.

On the south-east angle of the upper terrace there are two handsome saloons, or kioums, lately erected, the roofs composed of different stages, supported by pillars; we judged the length of each to be about sixty feet, and the breadth thirty: the ceiling of one is already embellished with gold leaf, and the pillars are lackered; the decoration of the other is not yet completed. They are made entirely of

wood: the carving on the outside is laborious and minute: we saw several unfinished figures of animals and men in grotesque attitudes, which were designed as ornaments for different parts of the building. Some images of Gaudma, the supreme object of Birman adoration, lay scattered around.

At each angle of the interior and higher terrace there is a temple sixty-seven feet high, resembling, in miniature, the great temple: in front of that, in the south-west corner, are four gigantic representations, in masonry, of Palloo, or the evil genius, half beast half human, seated on their hams, each with a large club on the right shoulder. The Pundit who accompanied us, said that they resembled the Rakuls of the Hindoos. These are guardians of the temple.

Nearly in the centre of the east face of the area are two human figures in stucco, beneath a gilded umbrella; one, standing, represents a man with a book before him and a pen in his hand; he is called Thasiamee, the recorder of mortal merits and mortal misdeeds; the other, a female figure kneeling, is Mahafumdera, the protectress of the universe, so long as the universe is doomed to last; but when the time of general dissolution arrives, by her hand the world is to be overwhelmed and everlastingly destroyed.

A small brick building near the north-east angle contains an upright marble slab, four feet high, and three feet wide; there is a long legible inscription on it. We were told it was an account of the donations of pilgrims of only a recent date.

Along the whole extent of the north face of the upper terrace there is a wooden shed for the convenience of devotees who come from a distant part of the country. On the north side of the temple are three large bells of good workmanship, suspended high the ground, between pillars; several deers horns lie strewn around; those who come to pay their devotions first take up one of the horns, and strike the bell three times, giving an alternate stroke to the ground: this act, we were told, is to announce to the spirit of Gaudma the approach of a suppliant. There are several low benches near the foot of the temple, on which the person who comes to pray places his offering, commonly consisting of boiled rice, a plate of sweetmeats, or cocoa-nut fried in oil; when it is given, the devotee cares not what becomes of it; the crows and wild dogs often devour it in presence of the donor, who never attempts to disturb the animals. We saw several plates of victuals disposed of in this manner, and understood it to be the case with all that was brought.

There are many small temples on the areas of both terraces, which are neglected, and suffered to fall into decay. Numberless images of Gaudma lie indiscriminately scattered. A pious Birman who purchases an idol, first procures the ceremony of consecration to be performed by the Rhahaans; he then takes his purchase to whatever sacred building is most convenient, and there places it within the shelter of a kioum, or on the open ground before the temple; nor does he ever again seem to have any anxiety about its preservation, but leaves the divinity to shift for itself. Some of those idols are made of marble that is found in the neighbourhood of the capital of the Birman dominions, and admits of a very fine polish, many are formed of wood, and gilded, and a few are of silver; the latter, however, are not usually exposed and neglected like the others. Silver and gold are rarely used, except in the composition of household gods.

On both the terraces are a number of white cylindrical flags, raised on bamboo poles; these flags are peculiar to the Rhahaans, and are considered as emblematic of purity, and of their sacred function. On the top of the staff there is a heuza, or goose, the symbol both of the Birman and Pegue nations.

From the upper projection that furrounds the base of Shoemadoo, the prospect of the circumjacent country is extensive and picturesque; but it is a prospect of nature in her rudest state; there are few inhabitants, and scarcely any cultivation. The hills of Martaban rise to the eastward, and the Sitang river, winding along the plains, gives an interrupted view of its waters. To the north-west, about forty miles, are the Galladzet hills, whence the Pegue river takes its rise; hills remarkable only for the noisome effects of their atmosphere. In every other direction the eye looks over a boundless plain, chequered by a wild intermixture of wood and water.

Tradition reports that the temple of Shoemadoo was founded 2300 years ago by two merchants, who were brothers, and who came to Pegue from Tallowmeou, a district of one day's journey E. of Martaban. These pious traders at first raised a temple one Birman cubit (22 inches) in height: a cubit was miraculously added in one night; the merchants added another cubit, which was again miraculously doubled; and thus the building attained the altitude of 12 cubits: and the temple was afterwards gradually augmented by successive monarchs of Pegue.

The cows in the vicinity of Pegue are of a diminutive size, resembling the breed on the coast of Coromandel, but the buffaloes are noble animals, superior to those of any other part of India. These are used both for draft and agriculture. The only article of consequence manufactured at Pegue is silk and cotton cloth; it is well wrought, but they make no more than what suffices for their own consumption.

In the town of Pegue there are only three persons, besides the Maywoon or viceroy, whose rank entitles them to distinction. These officers exercise the function of magistrates, and hold separate courts at their own houses, for the determination of petty suits; but all causes of importance relating to property, and matters of an high criminal nature, are solemnly tried in open court, in which the three officers unite, and form a tribunal which sits at the "Rhoom," or public hall of justice, and the ultimate decision rests with the Maywoon. N. lat. 17° 40'. E. long. 96° 11' 15". Symes's Ava, vol. ii. Asiatic Researches, vol. v.

PEGUE, a river of Asia, in the vicinity of the city of the same name. It is called by the natives "Bagoo Kioup," or Pegue rivulet, to distinguish it from Mioup, or river. This river is navigable but a very few miles to the northward of the city of Pegue, and for this it is indebted wholly to the action of the tide. It has no communication with the sea, except by the Rangoon river, and, in the fair season, at low water, is almost dry. This stream has been sometimes mistaken for the Sitang river, about 15 miles E. of Pegue, which is a large and independent body of water, that partly describes the course that in the map is given to what is called the Pegue river.

PEGUNNOCK, a N.W. branch of Passaik river, in New Jersey, North America, which rises in Suffex county. The town of its name lies between it and Rockaway, another branch S. of this river, N.W. of Morrilown.

PEHL, a town of Aultria; 6 miles W. of Wells.

PEI, a city of China, of the second rank, in Se-tchuen, on the Kincha river; 720 miles S.S.W. of Peking. N. lat. 29° 50'. E. long. 107°.

PEICHELSTEIN, a town of Tyrol; 5 miles S.S.W. of Reutten.

PEJEND, or PAJANA, the most considerable lake of Finland, about 80 miles in length by 15 in breadth, which gives source to the river Kymmen.

PEJEPSCOL, or PEGYPSKEAG, a township of America,

rica, in Cumberland county, Maine, adjoining Poland, Durham, &c. on the westerly bank of Great Ameriskoggen river, about 30 miles N. of Portland.

PEI-HO, or *White River*, a river formed by several streams in the province of Pe-tche-li, and which runs into the gulf of Pe-tche-li. The mouth of the river is traversed by a bar, stretching N.N.E. and S.S.W., over which, at low water, the depth is not more than three or four feet, and in many places it is almost dry. The tides rise and fall six or seven feet at the mouth of the river: the time of high water, at the full and change of the moon, is about half after three; and five or six miles outside of the mouth of the river a large bamboo beam is placed upon the bar, together with some of a smaller size, continued nearly in a straight line to the shore, intended as marks to direct vessels entering into the river. The town of Ta-coo lies within the Pei-ho, and is the first place of any note in this part of the N.E. frontier of China. Yachts, or large covered barges, and boats of burthen, calculated to pass over the shallows of the Pei-ho, may be obtained here, in order to enable persons to proceed as far as this river leads, towards Peking, the capital of the empire. The progress upon the Pei-ho is necessarily very slow, as the course of the river is remarkably serpentine. The fields on each side exhibit a high state of cultivation, and are generally covered with the holcus sorghum, or the tallest of the vegetables producing esculent grain, commonly called Barbadoes millet; it grows to 10 or 12 feet high, and the lowest calculation of its increase is one hundred-fold. The houses in the villages near the river are constructed of bricks ill-burnt, or baked in the sun, which, as well as the tiled roofs, are plastered over with a muddy coloured substance, unmixed with lime. Near some of the towns and villages are pyramids about 15 feet high, but of different dimensions as to both length and thickness. They consisted of bags of salt, heaped together in that form, and covered merely with common matting. As soon as night comes on, the banks of this river are illuminated with variegated lights, from lanterns whose transparent sides were made of different coloured paper. The different numbers of lanterns hoisted on the masts' head of the various vessels in the river denote the ranks of the passengers they hold; all which, together with the lights from the cabins of the junks, reflected from the water, produce a moving and parti-coloured illumination. The salt, already mentioned, brought from Quan-tong and Fo-chien into the Pei-ho, is sufficient to load annually nearly 2000 vessels of 200 tons burden each.

At *Tien-sing* (which see) two rivers unite; one of which retains the name of Pei-ho; and the other is called "Yun-leang-ho," or grain-bearing river, from the quantities of wheat conveyed upon it from the province of Shen-see, and sent up by the Pei-ho to the neighbourhood of Peking. About 30 miles beyond Tien-sing, towards Peking, the tide of the Pei-ho ceases, and the progress of the yachts, &c. is effected by rowing with oars, or towing with ropes, and their advance is very slow against the current of the river. Large junks, to the number of 1000, each of which contains not less than 50 persons, and therefore in the whole amount to 50,000, are passing between Tong-choo-foo and Tien-sing; and as many more of other kinds of craft; so that upon a branch of a single river, the population of its moveable habitations amounts to 100,000 persons. Tong-choo-foo, where the water becomes too shallow for the navigation of yachts of any burden, is 90 miles distant from Tien-sing, and 12 miles from the city of Peking. The mouth of the river Pei-ho, in the gulf of Pe-tche-li, is in N. lat. 39°.

PEILLAC, a town of France, in the department of the Morbihan; 16 miles E. of Rochefort.

PEILSTEIN, a town of Austria; 4 miles S. of Aigen.

PEINA, a town of Westphalia, in the bishopric of Hildesheim, in a marshy country, on the Fufe, formerly reckoned among the fortresses. The inhabitants are chiefly Lutherans. It has an episcopal palace, a Capuchin convent, and a suburb called the "Damon," which is mostly inhabited by shopkeepers and Jews; 15 miles N.N.E. of Hildesheim. N. lat. 52° 10'. E. long. 10 18'.

PEINT, a town of Hindoostan, in Baglana; 28 miles N.W. of Nafuck.—Also, a town of Hindoostan, in Guzerat; 20 miles S. of Dungepour.

PEINTADE, in *Ornithology*. See *NUMIDA Meleagris*.

PEIPUS LAKE, or *Tchudskoe*, in *Geography*, a lake of Russia, which lies between the governments of Pfcove, Reval, Riga, and St. Petersburg, extending in length to about 80 and in breadth to 60 versts. By means of a very broad strait it is connected with the Pfcove lake, the length of which is stated to be 50, and the breadth, which is always decreasing, 40 versts. This latter receives the river Velikaia. Out of the Peipus comes the Narova, which through the Embach has communication with the Vertz-erb lake; out of this, on the other hand, flows the Fellin into the gulf of Riga; and consequently a very beneficial water-passage might be made between Riga and some of the inland provinces, by way of the Peipus lake. In this lake there are a few small islands, none of which are sufficiently important to deserve notice except Perka or Bork, called by the Esthonians Porkafaar, which is not only inhabited, but furnished with forests, and has no less than three villages upon it. Among the several brooks and rivers that flow into the Peipus, the Embach is the most considerable. The exit is through the Narva river into the gulf of Finland. The multitude of fish that breed in this lake afford a lucrative occupation to the boors of these parts, and increase the revenues of the adjoining estates, the owners of which let out the parts on which their lands abut at a certain rent. The fish are principally rebfe, a species of herring, and barbel. Besides these, here are pike, perch, a species of carp, whiting, quebb, korushki, gudgeons, &c. The pike and some others are dried in the air and exported: the rebfe are sometimes smoked. N. lat. 58° to 59° 10'. E. long. 27° to 27 28'.

PEIRA, a town of Malacca, on the W. coast; 100 miles N.W. of Malacca. N. lat. 3° 40'.

PEIRCE, JAMES, in *Biography*, was born in London in the year 1673. He had the misfortune in early life to lose both his father and mother, and was placed under the care of his guardian, Mr. Matthew Mead, a celebrated minister at Stepney, in whose house he was instructed in the rudiments of learning by a private tutor. After this he spent some years in different grammar schools, till he was prepared for entering upon a course of academical studies, when he was sent to Utrecht. Here he attended the lectures of the most celebrated professors, among whom were Witflus, Leydecker, Grævius, and Leusden: he cultivated a strict friendship with some of the most distinguished of his fellow students, particularly with Adrian Reland. From Utrecht he removed to Leyden, where he had the opportunity of hearing Gronovius, Spanheim, and other professors of the highest character in the republic of letters. Having spent several years in these seminaries he returned to England, and lived for some time with his relations at London, and then took apartments at Oxford, where he had constant access to the Bodleian library. After this, at the request

request of his friends, he preached a Sunday evening lecture at Miles' Lane, London, but he does not appear to have interested himself in the dispute then subsisting between the Independents and Presbyterians. With the ministers of the latter denomination he became well acquainted, and at their solicitation he settled at Cambridge, where he acquired the respect and esteem of many members of the university. From Cambridge he removed to Newbury, in Berkshire, where he appeared to great advantage, in the year 1707, in a controversy with Dr. Wells, a clergyman of Leicestershire, who had attacked the principles and practice of the Dissenters, and whose mistakes and misrepresentations he ably exposed. Mr. Peirce after this published, at different periods, various able controversial tracts, relating to the rites imposed under the establishment; the validity of the dissenting ministry, and presbyterian ordination; and the imputed sin of schism.

The next work of our author was called for by the appearance of "A Defence of the Doctrine and Discipline of the Church of England," written in the Latin tongue, and submitted to the judgment of foreign divines, by Dr. Nichols, Latin secretary to the Society for the Propagation of the Gospel. In this work the author had given such a view of the controversy between the Church and Dissenters, as was intended to expose the latter to the censure and condemnation of their foreign brethren, on which account Mr. Peirce was earnestly solicited to undertake their vindication in the same language, for the purpose of counteracting the effects of Dr. Nichols' performance. He accordingly published his "*Vindiciæ Fratrum Dissidentium*," in which he gave a full and very satisfactory answer to his antagonist. This work was published in 1717 in the English language, with the title of "A Vindication of the Dissenters, &c." It consisted of three parts: the first contains the history of nonconformity; the second treats of the doctrine of the church of England; and the third contains all the heads relating to discipline and worship. It, in fact, presents the reader with a view of almost the whole controversy between the established church and the Dissenters. In 1718, Mr. Peirce took part in the controversy relating to the Test Act, and published "Letters" on the subject to a friend, and to Dr. Snape. He had previously to this removed from Newbury to Exeter, having had a general and most unanimous invitation from the three united congregations of the Dissenters in that city. In this situation he gave the greatest satisfaction in the discharge of the pastoral duties, till there arose a controversy concerning the explication of the Trinity, which was productive of very disgraceful consequences. He had been educated in the trammels of orthodoxy as it was called, but had, during his ministry, learnt to shake off all those unscriptural phrases, which then, as well as now, were looked on as a kind of test of a man's religious opinions. He considered the scriptures as the only rule of faith, and from a very early period he took care to use their language in his sermons, when he introduced any doctrinal topic, and as he advanced in years he grew more careful in his adherence to this practice. The doctrine of the Trinity he looked upon as a *mystery*, and was averse from speaking or even thinking upon it. But his attention was unavoidably drawn to it by the clamour which was raised concerning his friend Mr. Whiston, for whom he had a high esteem, and at first he was exceedingly hurt to learn that Mr. Whiston had declared against the current doctrines of the day. He expostulated with his friend, but instead of convincing him of his error, he himself became a convert to the heresy that he had been ready to condemn.

"The reader," says Mr. Peirce, "will easily imagine

that this must have been a terrible shock to me, and that I must have had a great concern upon my mind, when I found myself at a loss about a doctrine, of which I had been all along fond, to a great degree of uncharitableness. However, this caused me to read the bible with more care, and make it more my prayer to God, that I might be led into the truth." It was not long before he was fully satisfied that the common opinion was not accordant with the doctrines held forth in scriptures. Being suspected of holding heretical opinions, he was attacked in the most hostile manner, and there can be no doubt that had his opponents possessed the power, they would most cheerfully have burnt him at the stake.

They required him to subscribe a test he refused, because he believed that the worst mischief had been done to the church of God by imposing unscriptural creeds and tests upon men, and he said he would never tamely surrender the liberty with which he had been made free. They turned him out of his meeting, and excited the clamour of the mob against him, by stigmatizing him and his friends with the then opprobrious epithet of *Arians*. Under these circumstances, Mr. Peirce found it necessary, for the vindication of his own character, and that of his friends, to lay a true state of the affair before the public, and accordingly published "The Case of the Ministers ejected at Exon." In 1720 he gave the world a much larger work, entitled "The Western Inquisition, or a Relation of the Controversy which has been lately among the Dissenters in the West of England," which contains a full account of the origin, progress, and issue of the nefarious and cruel persecution with which our author was harassed. To this a reply was published, entitled "An Answer to Mr. Peirce's Western Inquisition, &c." Mr. Peirce now took leave of the controversy by a very able and satisfactory piece, entitled "Inquisition Honestly displayed, or the Western Inquisition defended against the pretended Answer, &c."

From this period Mr. Peirce applied himself to the diligent discharge of his pastoral duties among a respectable people, by whom he was highly honoured and beloved, and to the completion of some explanations of the sacred writings, in which he had made considerable progress. The first fruits of his learned studies were given to the world in 1725, but without his name, in "A Paraphrase and Notes on the Epistle of St. Paul to the Colossians," 4to.; in which he endeavoured to follow the admirable rules and example of Mr. Locke, whom he considered as having done more than any other writer towards rendering St. Paul's epistles easy and intelligible. This publication was well received; and in the same year he gave the world "A Paraphrase and Notes on the Epistle of St. Paul to the Philippians." He intended to proceed with similar commentaries on all the other Epistles attributed to this apostle, excepting those that had been before paraphrased by Mr. Locke. His next attempt was on "The Epistle to the Hebrews," which he did not live to finish, for while he was engaged in it, he was attacked by a disorder which put an end to his life, on the 30th of March 1726, in the 53d year of his age.

The persecution which he had met with during his life pursued him even to the grave: for his relations having directed that a Latin inscription, containing an encomium on his learning and virtues, should be cut on a tomb-stone, the rector of the church in which his remains were deposited would not permit it to be placed in his church-yard; stating that he could not, in conscience, suffer a person so notorious for heresy to be warmly recommended to posterity in any place under his care and inspection. When it was afterwards requested that these words might be inscribed on his

his tomb, "Here lies the reverend, learned, and pious Mr. James Peirce," but it was refused, the rector assuming that Mr. Peirce could not be *reverend*, because he was not lawfully ordained, and that he was not pious, because he taught errors, so that the only inscription allowed, was "Mr. James Peirce's tomb." On a monument erected to his memory in the meeting-house in which he latterly officiated, he is held out to the veneration of posterity, as a rational, judicious, and affectionate preacher; a very laborious and sagacious interpreter of the Holy Scriptures; a sincere lover and strenuous defender of the truth; and a courageous sufferer for maintaining the doctrines of the gospel of Christ, and for asserting the liberties of Christians.

After the death of this excellent man, his "Paraphrase and Notes on the Epistle of St. Paul to the Hebrews, with Dissertations on several Texts of Scripture," were published in 1727, though evidently left in an unfinished state. The work was afterwards completed by Mr. Joseph Hallet. From Mr. Peirce's MSS. were also published "An Essay in favour of the ancient Practice of giving the Eucharist to Children" and other tracts.

PEIRESC, NICHOLAS-CLAUDE FABRI DE, a considerable promoter of literature, descended from the ancient family of Fabri of Pisa in Italy, was born in Provence in 1580. At ten years of age he was sent, with his younger brother, to the Jesuits' college at Avignon, where he continued five years. At the early age of seven he was appointed to the sole superintendance of his brother's education, who was about a year and a half younger than himself. In 1595 he removed to Aix, where he commenced the study of philosophy. At this time he became passionately fond of the medallic science, and the remains of antiquity. In 1596 he finished his course of philosophy and mathematics in the Jesuits' college at Tournon, and he afterwards studied the law at Aix. He was sent, in 1599, with his brother and a tutor to travel in Italy, and further prosecute his legal studies at Padua. He paid frequent visits to Venice, and became acquainted with several distinguished persons, particularly with father Paul, and the procurator Fred. Contarini. The fine cabinet of medals possessed by the latter was a peculiar object of attention to Peiresc, who gave the owner explanations of the Greek inscriptions. Rome was the next object of our youthful traveller's curiosity, and it gave ample gratification to his love of antiquities, and his desire of forming acquaintances among the learned. In 1601 he proceeded to Naples, and having thoroughly surveyed every thing worthy of observation in that city and its vicinity, he completed the tour of Italy, by returning along the coast of the Adriatic to Padua. He there resumed the study of the law, and likewise, at the same time, acquired a knowledge of the oriental languages, in which he was assisted by a learned rabbi named Solomon. Returning to France in 1602, he continued his studies at Montpeier, and in 1604 he took the degree of doctor of laws at Aix, after sustaining disputations for three days with great applause. In the following year he went to Paris, and in 1606 he visited England, where he was graciously received by king James. Of the learned men in this country, Camden, on account of his antiquarian knowledge, was particularly acceptable to him. On his return by Holland, he became personally acquainted with Joseph Scaliger and Grotius. After he had finished his travels, he was made counsellor to the parliament of Aix, which office he held, though in 1618 he entered into the ecclesiastical state, and was presented to an abbacy of the Benedictine order.

The great occupation of Peiresc during his whole life was the acquisition of knowledge, and the encouragement of

learned men, and no person of his time maintained such an extensive correspondence with the literati of different classes and countries. The chief objects of his enquiries and communications embraced philosophical experiments, natural history, rare products of art, antiquities, history, and philology. He formed for himself a museum of valuable curiosities, and a copious library, and then liberally opened his stores to authors and students. He has been characterized as a true citizen of the republic of letters, and a kind of general agent of learning throughout civilized Europe. He died in 1637, in the 57th year of his age. His funeral at Aix was conducted with great solemnity, and a collection of eulogies to his memory was printed in a variety of languages. The vast variety of objects which his studies comprehended prevented him from finishing any thing, so as, in his own opinion, to be fit for the public eye, but he left behind him a great number of MSS. on local history and antiquities, mathematics and astronomy, the medallic science, languages, &c. Of the writings of this scholar there have been published 48 Italian letters, addressed to Paolo and Giambattista Gualdo, in the "Lettere d'uomini illustri;" a considerable number of letters among those of Camden, and a long and learned dissertation on an ancient tripod found at Frejus, in the *Mém. de Literature et de l'Histoire*, by Desmalets, in 1731.

PEISDORF, in *Geography*, a town of Bohemia, in the circle of Königgratz; 14 miles N.E. of Gitschin.

PEISKREITSCHAM, or PYSLOWICE, a town of Silesia, in the principality of Oppeln; 12 miles W.N.W. of Beuthen.

PEITSCHENDORF, a town of Prussia, in Bartenland; 22 miles S. of Rastenburg.

PEITZ, a town of Brandenburg, in the Ucker Mark, on a small river which runs into the Spreke. In its vicinity are iron mines, and manufactures of pitch and turpentine; 20 miles E.S.E. of Luben. At the peace of Tilsit, this town was ceded to Saxony. N. lat. $51^{\circ} 53'$. E. long. $14^{\circ} 40'$.

PEIXE, in *Ichthyology*. See *ZEUS Gallus*, and *CENTRISCUS Scutatus*.

PEKAN, in *Zoology*. See *MUSTELA Canadensis*.

PEKEA, in *Botany*, a West Indian name for a tree of Cayenne, which bears an excellent nut, sometimes sold in the fruit-shops of London, by the name of Suwarrow nut. Aublet figures this species in his t. 239, and another in t. 238. See *RHIZOBOLUS*.

PEKENEN, in *Geography*, a town of Africa, on the Grain coast; 15 miles S. of Sanguin.

PEKET, a town on the N. coast of the island of Cumbava. S. lat. $8^{\circ} 15'$. E. long. $117^{\circ} 36'$.

PE-KIANG, a river of China, which rises near Nan-yang, in the north part of the province of Quan-tong, and runs into the river Canton, 30 miles below Canton. This river continues its course through an extent of about 260 miles, to the city of Canton; from thence it falls, after a further course of about 80 miles, into the southern sea of China, near which it takes, among foreigners, the name of Bocca Tigris. For a great part of its course to the northward of Canton, it lies between two ranges of calcareous hills, consisting of rugged eminences with intervening plains between them, on which are erected small neat houses, surrounded by patches of land under cultivation, and apparently accessible only by the river. In its bed frequently occur heaps of stones, with stakes of wood, forming dams, with sluices, through which the water runs, and in these are placed baskets of wicker-work, which allow the fish to pass, but prevent their regrefs; thus rendering them a prey to the proprietors of these snares. As soon as the hills opposite to each other begin

begin to be less rugged, tobacco is planted on their flanking sides; but some of the mountains are barren and of a horrid aspect, and formed of rocks piled upon rocks in a variety of fantastic forms, and threatening passengers sailing on the river under their over-hanging heads. Other hills consist chiefly of mines of coal rising directly from the river, and opening into day; the contents of which are loaded immediately on barges from the mouth of an horizontal shaft. This is a pulverizable kind of coal, usually called culm coals. As the river becomes sufficiently deep and wide, the passage barges are changed for larger and more commodious yachts. The volume of water is increased by the junction with another considerable stream proceeding from the N.W. At their confluence stands the city of "Chau-coo-foo," the environs of which are pleasant and romantic. The plains are sown with rice and tobacco, whilst the rising grounds produce cotton and the sesanqua. On one side of the river is an immense rock of grey coarse marble, estimated to be about 600 feet in height; and in a fissure close to the water's edge, and accessible only by boats, is a temple, inhabited by Ho-shaung, or priests of Fo, who worship in it a variety of deified heroes, and of virtues and passions personified. This temple consists of several apartments, one over the other, of considerable height, consisting chiefly of excavations made into the rocks; and above them is an immense mass of stalactites, not less, in appearance, than a ton in weight, out of which proceed a vast number of ramifications. A plain, terminated only in the horizon, at length succeeds to the double range of heights through which the river had flowed mostly from its source. The stream is here widened, and soon meets the tide flowing from the southward. The adjoining country is intersected by large canals for the purposes of navigation, and others of a smaller size for occasionally watering the grounds. The whole exhibits every mark of fertility, industry, and populousness. The principal cultivation is that of rice, with some groves of mulberry trees. Along this river, as it approaches Canton, are nurseries of curious plants and country houses belonging to the principal native merchants of that city. The city and suburbs of Canton are situated mostly on the eastern bank of the Pe-kiang river. See CANTON.

PE-KING, or PEKIN, the capital of the province of Petcheli, and of the whole empire of China proper. Its name is said to signify the "Northern court," and it is so called by way of distinction from the city of Nan-king, denominated the "Southern court." Pekin was the Cambalu, or city of the Chan, in writings of the middle ages, the capital of Cathay, as Nan-king was of Mangé. It is situated in a fertile plain, 20 leagues distant from the great wall. The road to it from Tong-choo-foo forms a magnificent avenue, for persons and commodities bound for that capital from the east and from the south. It is perfectly level; the central part, to the width of about 20 feet, is paved with slabs of granite, brought from a considerable distance, and of a size from six to sixteen feet in length, and about four feet broad. On each side of this granite pavement is a road unpaved, wide enough for carriages to cross upon it; the road is bordered in many places with trees, particularly willows of a very uncommon girth. The passage lies over a marble bridge, very wide, and substantially built, which traverses a rivulet, not subject to inundations; and is little elevated above the level of the roads, which it connects together. Those who enter the city in this direction, arrive at length at one of the eastern suburbs, along a street that is paved, and that exhibits a busy scene of manufacturers, shop-keepers, and buyers. We shall first trace the progress of the embassy under lord Macartney through this city, and

then more particularly describe the city itself. To traverse the suburb, required about 15 minutes, when the party arrived before the walls of Pekin. Near the gate of entrance the walls were faced with stone, but elsewhere with brick; over the gate was a watch-tower several stories high. In each story were painted port-holes for cannon. Round the gate, on the outside, was a semi-circular wall, with a lateral gate. The city walls were about 40 feet high; the parapet was deeply crenated, but had no regular embrasures, nor did any cannon appear upon the walls; but in the merlons were loop-holes for archery. The thickness of the walls at the base was about 20 feet, and 12 across the terre-pleine, upon which the parapet was erected. The outside of the city wall, though not perfectly perpendicular, was smooth, but the inside was upon a considerable level; the rows of bricks which form it being placed, like steps, one above and behind the other, such as are described to be the faces of the Egyptian pyramids. The walls were flanked on the outside by square towers, at about 60 yards distance from each other, and projecting from the curtain between them 40 or 50 feet. Several horsemen might ride abreast upon the ramparts, ascending to them upon slopes of earth raised on the inside.

Few of the houses in Pekin were higher than one story; none more than two: while the width of the street which divided them was considerably above 100 feet: so that it was airy, gay, and lightsome. The street was unpaved, and water sprinkled on it to lay the dust. A light handsome building was erected across it, called by the Chinese "Pei-loo," translated so as to signify a triumphal arch, though no part of it resembles an arch. The whole was built of wood, and consisted of three handsome gate-ways, of which the middle is the highest and largest. Over these were constructed three roofs above each other, richly decorated. Large characters painted or gilt upon the uprights or transoms, indicated the purpose for which the pei-loo was erected. They are meant to compliment particular persons, or to perpetuate the memory of some interesting event.

The first street extended in a line directly to the westward, until it was interrupted by the eastern wall of the imperial palace, called the Yellow wall, from the colour of the small roof of varnished tiles, with which the top of it is covered. Various public buildings, seen at the same time, and considered as belonging to the emperor, were covered in the same manner. These roofs, uninterrupted by chimnies, and indented in the sides and ridges into gentle curves, which heightened the effect, were adorned with a variety of figures, either in imitation of real objects, or more commonly as mere works of fancy: the whole shining like gold under a brilliant sun, immediately caught the eye with an appearance of grandeur in that part of buildings where it was not usual to seek for it. Immense magazines of rice were seen near the gate: and looking from it to the left, along the city wall, was perceived an elevated edifice, described as an observatory, erected, in a former dynasty, by the emperor Yong-loo, to whom the chief embellishments of Pekin are said to be owing. In front of most of the houses in this main street were shops, painted, gilt, and decorated, in a grand style. Over some of them were broad terraces, covered with shrubs and flowers. Before the doors were hung several lanterns of horn, muslin, silk, and paper, fixed to frames, in varying the form of which the Chinese seemed to have exercised their fancy to the utmost. Outside of the shops, as well as within them, was displayed a variety of goods for sale.

As soon as the persons belonging to the embassy had arrived

rived at the eastern side of the Yellow wall, they turned along it to the right, and found on its northern side much less bulle than in the former street. Instead of shops all were private houses, not conspicuous in the front. Before each house was a wall or curtain, to prevent passengers from seeing into the court into which the street-door opened. This is called the wall of "respect." A halt was made opposite to the treble gates, which are nearly in the centre of this northern side of the palace-wall. It appeared to inclose a large quantity of ground. It was not level like all the lands without the wall: some of it was raised into hills of steep ascent: the earth taken to form them left broad and deep hollows, now filled with water. Out of these artificial lakes, of which the margins were diversified and irregular, small islands arose with a variety of fanciful edifices, interspersed with trees. On the hills of different heights the principal palaces for the emperor were erected. The whole had somewhat the appearance of enchantment. On the summit of the highest eminences were lofty trees surrounding summer-houses, and cabinets contrived for retreat and pleasure. From the spot whence an opportunity thus offered to take a glance through the gates of the palace-wall, of part of what was inclosed within it, the eye, turning to the north, observed through a street extending to the city wall, the great palace, of considerable height, which includes a bell of prodigious size and cylindric form, that, struck on the outside with a wooden mallet, emits a sound distinctly heard throughout the capital. Beyond it, but more to the westward, was one of the northern gates, the watch-tower over which rendered it visible above the intermediate buildings. Proceeding on beyond the palace-gates directly to the westward, between the Yellow wall and the northern buildings of the city, is a lake of some acres in extent, which in autumn was almost entirely overspread with the peltated leaf of the nymphæa nelumbo, or lien-wah of the Chinese.

The route was continued westerly through the city. Among other buildings was seen a library of foreign MSS. one of which was said to be an Arabic copy of the Koran. Some Mahometans were observed distinguished by red caps; and also natives of Tartary, or females of a Tartar race. Their feet were not cramped, like those of the Chinese; and their shoes with broad toes, and soles above an inch in thickness, were as clumsy as those of the original Chinese ladies were diminutive. Some few of the former were well-dressed, with delicate features, and their complexions heightened by the aid of art. A thick patch of vermilion in the middle of the lower lip, seemed to be a favourite mode of using paint. Some of them were sitting in covered carriages, of which, as well as of horses, there are several to be found for hire in various parts of the town. A few of the Tartar ladies were on horseback, and rode astride like men. Several of the streets were narrow, and at the entrance of them gates were erected, near which guards were stationed, for quieting any occasional disturbance in the neighbourhood. These gates are shut at night, and opened only in cases of exigence. The train of the embassy crossed a street which extended N. and S. the whole length of the Tartar city, almost four miles, and is interrupted only by several pei-loos, or triumphal fabrics; and passing by many temples and other spacious buildings and magazines, they reached, in little more than two hours from their entrance on the eastern side, to one of the western city gates. Near this gate, and along the outside of the western wall, ran the small rivulet, (here widened into a considerable ditch,) which, after almost surrounding Peking, runs towards Tong-choo-foo, and falls into the Pei-ho: the suburb beginning at this western gate, being more extensive

than that through which they had entered into the city, took for traversing it upwards of twenty minutes.

The embassy found, in proceeding N.W. from Peking, the same kind of granite pavement over which they had travelled to that city from Tong-choo-foo. It led them to the open town of Hai-tien, containing few other buildings besides those intended for the sale of goods, and for the accommodation of artificers, near the autumnal palace of Yuen-min-yuen, which lies a little way beyond it. The shops of Hai-tien, besides necessaries, abounded in toys and trifles, calculated to amuse the rich and idle of both sexes. Between Hai-tien and Yuen-min-yuen, was the villa intended for the ambassador and his suite, which was an inclosure of twelve acres. It contained a garden laid out in serpentine walks, a rivulet winding round an island, a grove of various trees, interspersed with patches of grass ground, and diversified with artificial inequalities, and rocks rudely heaped upon each other. The building in this place consisted of several separate pavilions, erected round small courts. The apartments were handsome, and not ill contrived. Several of them were adorned with landscapes, painted in water-colours.

The capital of Peking bears not in size the same proportion to the rest of China that London does to Britain. The principal part of it is called the Tartar city, from the circumstance of its having been laid out anew in the 13th century, in the time of the first Tartar dynasty, or as Du Halde says, because the houses were allotted to the Mandshurs, in the beginning of the present dynasty. It is in the form of a parallelogram, of which the four walls face the four cardinal points. They include an area of about fourteen square miles, in the centre of which is the imperial palace, occupying within the Yellow wall at least one square mile, the whole being about one-third larger than London, on its present extended scale; whereas the fifteen ancient provinces of China, independently of the vast accession of territory from the great wall to the neighbourhood of the Caspian sea, bear a proportion to Great Britain of about 15 to 1. Adjoining, indeed, to the southern wall of the Tartar city, is another, called, by way of distinction, the Chinese city. Here most of the people lodge, who come occasionally upon business from the provinces to the capital. Its walls, which are greatly in decay, include likewise a very considerable space, about nine square miles. A small part only, however, is occupied by buildings, which are indifferent, crowded, and irregular; the rest is empty, and part of it is in cultivation. Within this compass has been raised the "Sien-nong-tan," or eminence of venerable agriculturists. Thither the emperor repairs every spring, and in compliance with ancient usages, goes through the ceremony of directing with his own hand the plough through a small field, by way of doing honour to the profession of a husbandman. When this part of the ceremony is finished, a group of peasants chaunt round him hymns in praise of husbandry, following his example, and making several furrows with the plough in his presence. The produce of the ground he has ploughed is carefully collected, and solemnly announced to surpass, in quality and quantity, what any other spot of equal dimensions had yielded in the year. The celebration of this festival is made known as far as the remotest village of the empire. Within the walls of the Chinese city has likewise been erected the "Tien-tan," or eminence of heaven. The single character "tien," or heaven, is inscribed upon the principal building in this eminence. Its form is round, in allusion to the vault of the heavenly firmament, as it strikes the eye; in like manner the "Tee-lan," a temple dedicated to the earth, which the ancient Chinese supposed to be a perfect

PE-KING.

fect square, is of a square form. In the summer solstice, when the heat and power of the sun are at the highest, the emperor comes in solemn procession to pay obedience, and offer thanks for its benign influence, and in the winter solstice similar ceremonies are performed in the temple of the earth. This solemn adoration of heaven and earth is confined to the person of the emperor; and for his convenience is performed at Peking, where he likewise appears abroad, in a variety of other grand processions, suggested by the mixed views of policy and religion. There are few other ceremonies performed in Peking.

Peking is merely the seat of the government of the empire. It is not a port, nor a place of inland trade nor manufacture. No representative diet, nor general states, with numerous retainers, assemble there to assist, or check, or examine, the measures of the crown. It forms no rendezvous for pleasure and dissipation. Peking owes little of its extent and populousness to the various circumstances that contribute to aggrandize and enlarge European cities. Most men there have stations regularly allotted them, or are occupied in attending or providing for those who have. From the operation of a variety of causes in China, there is a constant tendency to level wealth; as there is no right of primogeniture, nor any hereditary dignity, the extremes of wealth and poverty are equally unknown. There are properly but three classes of men in China, men of letters, from whom the mandarins are taken, cultivators of the ground, and mechanics, including merchants. To these we might add a fourth class, *viz.* the military. In Peking alone is conferred the highest degree of literature, upon those who, in public examinations, are found most able in the sciences of morality and government, as taught by the ancient Chinese writers; with which studies the history of their country is intimately blended. Among such graduates, all the civil offices in the state are distributed by the emperor; and they compose all the great tribunals of the empire. The candidates for these degrees are such as have succeeded in similar examinations in the principal city of each province. Those who have been chosen in the cities of the second order, or chief town of every district in the province, are the candidates in the provincial capital. They who fail in the first and second classes have still a claim on subordinate offices, proportioned to the class in which they had succeeded. These examinations are carried on with great solemnity, and apparent fairness. Military rank is likewise given to those who are found, upon competition, to excel in the military art, and in warlike exercises. The great tribunals are situated, for the sake of convenience, near the southern gate of the imperial palace at Peking. To them all the transactions of the empire are regularly transmitted. They are councils of reference from the emperor, to whom they report every business of moment, with the motives for the advice which they offer on the occasion. His imperial majesty generally conforms to the suggestions of these tribunals, of which there are several, superior and subordinate.

The estimated population of Peking was supposed, in the last century, by the Jesuit Grimaldi, to amount to sixteen millions. Another missionary reduces, at least that of the Tartar city, to one million and a quarter. According to the best information given to the embassy, the whole was about three millions. The low houses of Peking seem scarcely sufficient for so vast a population; but very little room is occupied by a Chinese family, at least in the middling and lower classes of life. In their houses they have no superfluous apartments. A Chinese dwelling is generally surrounded by a wall, six or seven feet high. Within this inclosure a whole

family, of three generations, with all their respective wives and children, will frequently be found. One small room is made to serve for the individuals of each branch of the family, sleeping in different beds, divided only by mats hanging from the ceiling. One common room is used for eating. This arrangement renders the younger orderly and temperate in their conduct, under the authority and example of the older; and it enables the whole to subsist, like soldiers in a mess, with more economy and advantage.

The streets of Peking are thronged with people, the multitude of whom is increased by the mandarins of rank, appearing always with numerous attendants; and still more by circles of the populace round auctioneers, vendors of medicines, fortune-tellers, singers, jugglers, and story-tellers. The nobility of the court and princes of the blood never appear in public, without being surrounded by a large body of cavalry; and as their presence is required at the palace every day, their train alone would be sufficient to create confusion in the city. Besides, as there is a continual influx of the riches and merchandize of the whole empire into this city, the number of strangers that resort hither is immense. These are carried in chairs, or ride on horseback; and they are always attended by a guide acquainted with the streets, and with the houses of the nobility, and principal people of the city. In summer there are to be seen small temporary shops, where people are served with water cooled by means of ice; and eating-houses are every where to be met with, with refreshments of tea and fruits. Each kind of provision has a certain day and place appointed for its being exposed to sale. Nevertheless, the crowds of people at Peking do not prevent it from being healthy. The Chinese, indeed, live much in the open air, increasing or diminishing the quantity of their apparel according to the weather. The atmosphere is dry, and does not engender putrid disorders; and excesses productive of them are seldom committed. Great order is preserved among such multitudes; and the commission of crimes is rare. The police of the capital is so well regulated, that the safety and tranquillity of the inhabitants are seldom disturbed. At the end of every cross street, and at certain distances in it, there is a kind of cross bars, with sentry boxes, in each of which is placed a soldier; and few of these streets are without a guard-house. Besides, the proprietor or inhabitant of every tenth house, like the ancient tythingmen of England, takes it in turn to keep the peace, and be responsible for the good conduct of his nine neighbours. If any riotous company should assemble, or any disturbances happen within his district, he is to give immediate information of it to the nearest guard-house. The soldiers also go their rounds, and instead of crying the hour like our watchmen, strike upon a short tube of bamboo, which gives a dull hollow sound, that prevents those unaccustomed to it from sleeping. The viceroy of Peking is of the Tartar race, and is styled governor of the nine gates, that being the number of gates belonging to the city. His jurisdiction extends not only over the soldiers, but also over the people in every thing that concerns the police. In the suburbs only public women are registered and licensed: they are not very numerous, being proportioned to the small number of single men, and of husbands absent from their families to be found in the metropolis. In Peking, as well as in other parts of China, parents are less frequently neglected than infants are exposed. Female infants are, for the most part, chosen for this cruel sacrifice, because daughters are considered more properly to belong to the families into which they pass by marriage; while the sons continue to be the support and comfort of their own.

Notwith-

Notwithstanding all the means adopted for restraining this barbarous practice, a missionary, who was not inclined to exaggerate the evil, has reported that in Pekin about 2000 infants were every year exposed, of whom a considerable number perished. The missionaries, to their honour it must be acknowledged, have contributed to preserve many, and afterwards to maintain and educate them.

The principal building in Pekin is the imperial palace already mentioned: it stands in the middle of the Tartar city, at a little distance from the south gate; and the entrance to it is through a spacious court, to which there is a descent by a marble staircase, ornamented with two large copper lions, and a balustrade of white marble, which runs in the form of a horse-shoe, along the banks of a rivulet, that winds across the palace with a serpentine sweep: the bridges over it are of marble. At the bottom of this first court arises a façade with three doors: that in the middle is for the emperor only; the mandarins and nobles pass through those on the sides. These doors conduct to a second court, which is the largest in the palace; it is about 300 feet long, and 50 broad; an immense gallery runs round it, in which are magazines, containing rich effects, belonging to the emperor as his private property; for the public treasure is entrusted to a sovereign tribunal, called "Hou-pon." In this second court is the royal hall, called "Teintotien," or the hall of the grand union: it is built upon a terrace about 18 feet high, incrufted with white marble, and ornamented with balustrades of excellent workmanship. Here the mandarins arrange themselves, when they come, on certain days, to renew their homage, and perform those ceremonies that are appointed by the laws of the empire. This hall is almost square, and about 130 feet long; the ceiling is carved, varnished green, and loaded with gilt dragons. The pillars which support the roof within are six feet in circumference towards the base, and are coated with a kind of malthick varnished red; the floor is partly covered with coarse carpets, after the Turkish manner; but the walls have no kind of ornament, neither tapestry, lustres, nor paintings. The throne, which is in the middle of the hall, consists of a pretty high and very neat alcove. It has no inscription but the character "ching," which denotes excellent and perfect, as well as most wise and holy. It is ascended by steps in the front and on each side. Tripods and vessels of incense are placed on the sides, and before it is a small table, as an altar, on which are laid offerings of tea and fruit to the spirit of the absent emperor. As the Chinese attribute to their emperor perfections belonging to the deity, they conceive his dominion as virtually extending over the whole world. Believing the majesty of the emperor to be ubiquitous, they sacrifice to him when absent; and it is not therefore surprising that they should adore him when present. The adoration, or "Koteou," they pay him consists in nine prostrations of the body, the forehead being each time made to touch the floor; which is not only a token of the deepest humility and submission, but implies a conviction of the omnipotence of the personage to whom this act of veneration is performed. These abject prostrations are required not only from the subjects and tributary princes of the empire, but also from all strangers, however exalted. Upon the platform, opposite to the hall just mentioned, stand large vessels of bronze, in which incense is burnt, when any ceremony is performing. There are also chandeliers shaped like birds, and painted of different colours, as well as the wax candles that are lighted up in them. This platform is extended towards the north, and has upon it two lesser halls; one of them is a rotunda, that glitters with varnish, and is lighted by a number of windows. Here the emperor changes his

dress before or after any ceremony. The other is a saloon which opens to the north: through this door the emperor must pass, when he goes from his apartment to receive on his throne the homage of the nobility: he is then carried in a chair by officers dressed in long red robes bordered with silk, and caps ornamented with plumes of feathers. We may here observe, that the temples of Pekin have no claim to elegance, when compared to its palaces. The religion of the emperor is performed with great magnificence in Tartary, but in China it is new. The mandarins and men of letters venerate Confucius, and assemble in halls of simple construction; and the lower classes of the people are unable to contribute to the erection of splendid edifices for public worship. Besides, their attention is much taken up with their household gods. Every house has its altar and its deities. (See CHINA.) The imperial palace, which presents an assemblage of vast buildings, extensive courts, and magnificent gardens, is shut up on all sides by a double wall; the intervening space being occupied by houses belonging to the officers of the court and eunuchs, and by different tribunals. The exterior circumference of this palace is reckoned to be $1\frac{1}{2}$ league. The extent, grandeur, regular disposition of apartments, and singular structure of the pavilion roofs (already noticed), cannot fail to strike beholders with surprise. N. lat. $39^{\circ} 55'$. E. long. $116^{\circ} 28'$. Earl of Macartney's Embassy, by Sir G. Staunton, vol. ii. Barrow's China. Grofier's China, vol. i.

PELADA, a kind of alopecia, or distempered state of the body, occasioning the shedding of the hair, arising from a venereal cause.

PELÆAS, Πελαιας, in *Ornithology*, the name by which the ancients called that species of pigeon now known by the name of the *livia*, and *saffarolla*; a grey pigeon, of a very small size, and with some variegations of purple and green. See LIVIA.

PELAGIA, in *Natural History*, the name by which Pliny, and other of the ancient naturalists, have usually called the *purpura*.

PELAGIA, *St.*, in *Geography*, a town of Naples, in the province of Otranto; 3 miles N. of Tarento.

PELAGIÆ, formed of *πελαγος*, *marine*, or belonging to the sea, in *Natural History*, a term used to express such sea shells and fishes, as never, or very rarely, are found near the shores; but always reside in the deep, or in those parts of the bottom of the sea which are most remote from land.

PELAGIANS, PELAGIANI, in *Ecclesiastical History*, the denomination of a sect, well known in the church by the writings of St. Augustine.

The author of this sect, Pelagius, properly called Morgan, was a monk of Bangor: but the learned are at a loss whether it was of the monastery of Bangor in Wales, or that of the same name and order in Ireland. But he was a contemporary with St. Jerom and St. Augustine; and quitted his country to go and live in the East, according to the custom of the monks of those days, who were attached to particular houses like those of our own time.

Cœlestius, as some say, a native of Ireland, according to others, of Scotland, and again, as others say, of Campania, in Italy, was the colleague of Pelagius, in forming this sect. They both lived at Rome in great reputation, and were universally esteemed on account of their extraordinary piety and virtue. About the year 410 they published their doctrine, first in Sicily, and afterwards in Africa. From Africa Pelagius passed into Palestine, and Cœlestius remained at Carthage, whence, his errors being condemned in a council, A.D. 412, he went into the East. The former, under the protection of John, bishop of Jerusalem, made a public

profession of his opinions, and formed disciples in several places. In the year 415 he was accused by Orosius, a Spanish presbyter, whom Augustine had sent into Palestine for that purpose, before an assembly of bishops who met at Jerusalem, but was dismissed without the least censure, and was soon after fully acquitted of all errors by the council of Diospolis, a city of Palestine, known in Scripture by the name of Lydda. However, after this council, Pelagius and Cœlestius were condemned again, A.D. 416, by the African bishops assembled at Carthage, and those of Numidia assembled at Milevum. Soon after the controversy was brought to Rome, and referred by Pelagius and Cœlestius to the decision of Zosimus, who was raised to the pontificate, A.D. 417; and he pronounced in their favour, declared them sound in the faith, and unjustly persecuted by their adversaries. However, he was prevailed upon by the remonstrance of the Africans to change his mind, and he severely condemned those two persons, whom he had honoured with his approbation, and covered with his protection. They were also condemned by the council of Ephesus, A.D. 431; and, in short, the Gauls, Britons, and Africans, by their councils, and emperors, by their edicts and penal laws, demolished this sect in its infancy.

Pelagius absolutely denied all original sin, which he held to be the mere invention of St. Augustine; and taught that men are entire masters of their actions, and perfectly free creatures; in opposition to all predestination, reprobation, election, &c.

He owned, indeed, that the natural power of man needed to be assisted by the grace of God, to enable him to work out his own salvation; but, by this grace, he only meant outward assistance, *viz.* the doctrines of the law, and of the gospel.

Though, when pressed by those words of St. Paul, "Deus est enim, qui operatur in nobis," &c. he owned that it is God, in effect, that makes us will what is good, when he warns and excites us by the greatness of the glory we are to obtain, and by the promises of rewards; when he makes us love him by revealing his wisdom, &c.

These are Pelagius's own words, as cited by St. Augustine; who confutes him, and shews, that, besides these exterior graces, there are required other real and interior ones.

He owned, that the will of man is indeed aided by a real grace; but he added, that this grace is not absolutely necessary in order to live well; but that it only helps us to do well with the more ease.

Julian, one of his adherents, went farther yet; and owned that the assistance of grace was absolutely necessary to enable us to do perfect works.

In effect, the grand doctrine of the Pelagians was, that a man might accomplish all the commands of God by the mere power of nature; and that the gifts of grace were only necessary to enable him to act well more easily, and more perfectly.

PELAGIANS, *Semi.* See SEMI-PELAGIANS.

PELAGIE, in *Geography*, a river of Louisiana, which runs into the Missouri, N. lat. 38° 30'. W. long. 91° 30'.

PELAGIUS I. pope, in *Biography*, was a native of Rome, and became a deacon of the Roman church, and was employed in the capacity of nuncio at the court of Constantinople by several of the popes in succession. He was first sent to the imperial residence by pope Agapetus, in the year 535, where he rose into extraordinary favour with the emperor Justinian, the empress, and the leading persons at court. About the year 539 he was commissioned, together with Ephraim, patriarch of Antioch, and

Peter, patriarch of Jerusalem, to decide on the case of Paul, who had been banished to Gaza, on account of a deacon's death, to which he was said to have been privy. Having repaired to Gaza after the trial of the African prelate, sentence of deposition was pronounced upon him. While Pelagius was returning to Constantinople he met with some Palestine monks on their journey to that city, in order to prefer complaints to the emperor against the followers of Origen; and having promised them his interest at court, he succeeded in obtaining an edict from Justinian in 541, by which sentence of condemnation was passed upon the Origenists. In the mean time, he had betrayed the interests of pope Silverius at Constantinople, and, to ingratiate himself with the empress, became privy to the measures for securing the popedom to Vigilius, the usurper of the see. About the year 545 he returned to Rome, being either recalled by Vigilius, or, according to others, sent by Justinian with a large sum of money for the relief of that city, which was reduced to great distress by the incursions of the Goths. In 547 he was deputed by the citizens of Rome on an embassy to Totila, king of the Goths, for the purpose of dissuading that prince by his prayers from besieging the city, when, though he failed in the object of his mission, by his intercession he was the means of preserving the lives and liberties of numbers of the conquered Romans. In the same year Totila sent him in the character of ambassador to Constantinople, to negotiate a peace between the Goths and Romans. He adhered to Vigilius in all his disputes: in all his changes, condemning or approving those articles which the pope condemned or approved. With him he was banished for rejecting the fifth council; but recanting, when the pope recanted, he was with him released from his exile and recalled to Constantinople. He attended Vigilius on his return from the East; and upon the death of the pope in the island of Sicily, in the year 555, he hastened to Rome, the emperor having promised to raise him to that see if he survived Vigilius, upon his engaging to cause the fifth council to be universally received in the West. When Pelagius arrived at Rome, he found the people and clergy so highly enraged against him, that instead of electing him their bishop, they all with one consent separated themselves from his communion. What induced many to concur in this measure, was a strong report, that, in order to secure the object of his ambition, he had been accessory to the death of his predecessor. But Pelagius, relying on the support of the emperor, resolved to have himself ordained in defiance of the canons, as well as the electors. Having, therefore, engaged two Italian bishops to second his views, but these not being sufficient, he substituted in the room of a third a presbyter of Ostia, and by means of these three he was ordained a bishop. The Roman people still declared against his power, determining never to acknowledge him for their lawful bishop. Under these circumstances Pelagius applied to the emperor, and obtaining his interest and support, he was acknowledged the lawful bishop. No sooner was he settled in the quiet possession of his see, than he endeavoured to perform his engagement to the emperor, by persuading the western bishops to receive the fifth council. With this view he addressed letters to them, in which he attempted to prove, that the constitution of Vigilius was in no respect derogatory to the decrees of Chalcedon, and consequently that such as did not receive it ought to be deemed schismatics. So far, however, were his letters from producing the desired effect, that the bishops of Tuscany, Liguria, Venetia, Illyricum, Gaul, Spain, and Ireland, declared loudly against that constitution, and the fifth council, and

the Italian bishops, as well as the Irish, besides censuring the pope in the strongest terms, separated themselves from his communion.

Thus abandoned by almost all the bishops in the West, and finding his endeavours to satisfy them of his orthodoxy were ineffectual, he wrote to the emperor's chief general Narfes, exhorting him to restrain by his authority and power, those whom a reverence for St. Peter and his see could not restrain, or bring to a sense of duty. Narfes being of a mild and humane disposition, instead of acting as the pope desired, endeavoured by entreaties and persuasion to gain over those Italian bishops who were the subjects of the empire, and though he was at first not successful, by steadily adhering to the system of pacification, he in the end prevailed upon some of the bishops of Tuscany and Liguria to renew their communion with the see of Rome. About the year 557, a report was spread in Gaul, that the pope had departed from the genuine Catholic doctrine. Childebert, king of the Franks, sent an ambassador to Rome, for the purpose of examining into its truth, and of demanding of Pelagius a confession of his faith. In compliance with the king's demand, the pope transmitted to the monarch his confession, accompanied with solemn declarations, that he not only received, but was ready to defend, at the expence of his life, the holy faith of Chalcedon; yet maintaining, that nothing had been defined in the fifth council, but what was entirely agreeable to that faith and doctrine. Pelagius died in 560, after a pontificate of nearly five years, during which he had the mortification to see the authority claimed by the pretended successors of St. Peter almost universally disregarded by the western bishops, who persevered in condemning and rejecting a council which he had approved and received, and even suspected the orthodoxy of his creed because he received it. Sixteen letters which have been attributed to him, may be found in the fifth vol. of the Collect. Council. of which, however, the first is admitted by the editors of that work to be spurious.

PELAGIUS II. pope, was of Gothic extraction, and the son of Winigild, but a native of Rome. Upon the death of pope Benedict in 578, the see continued vacant four months, at the expiration of which Pelagius was chosen to fill that dignity. His election having taken place at a time when the Lombards were masters of the greatest part of Italy, and kept Rome itself closely besieged, it was judged expedient that he should be ordained before the emperor's confirmation could be received; but as soon as the siege was raised, he sent Gregory, then deacon in the Roman church, and afterwards his successor in the popedom, to excuse the informality, and to entreat the emperor's acquiescence in a proceeding which had been rendered necessary by the calamitous circumstances of the times. The Lombards, by their ravages, had now spread such devastation and terror in every part of Italy, that persons who had the character of holy men regarded them as the instruments of the divine vengeance to depopulate the country; and some of them fancied that they had revelations, which foretold them that the Lombards were the fore-runners of the last day, and that the end of the world was at hand. By the report of their visions the credulous multitude was terrified to such a degree, that instead of uniting against the common enemy, they abandoned themselves to despair, and suffered the barbarians to plunder and destroy without opposition. In this state of the empire in the West, the church continued to be divided by the schism which had been occasioned by the constitution of pope Vigilius, and not terminated by his successors. The talk of healing that schism, Pelagius considered to be one of the

first objects that merited his attention, and he determined to apply to it with the utmost zeal. The Lombards, however, occasioned the most serious alarms to the church, and obliged his holiness to pay more attention to the secular concerns of the state than to its spiritualities. They had conquered the important city of Pavia, and having made it the metropolis of their new kingdom, extended their conquests from thence over the adjacent provinces, threatening to advance a second time against Rome. This threat they were enabled to carry into execution without delay, since the exarch Longinus had not sufficient forces to meet them in the field. Under constant apprehensions, therefore, that they would speedily make their appearance at the gates of the city, Pelagius sent new legates to the emperor Tiberius, in the year 580, to lay before him an account of the defenceless state of Italy, and to solicit a supply of men and money, that the city of Rome itself might not fall into the hands of the barbarians. But the emperor, though wishing well to the cause, had it not in his power to send them any relief. Finding Italy thus abandoned by the emperor, in 581 the pope applied to Guntram, king of Burgundy, who was distinguished for his attachment to the bishops of Rome, and their see, exhorting and entreating him to renounce the alliance which he had lately concluded with the Lombards, and by turning his arms against them, prevent the entire subjugation of Italy. In this he was likewise unsuccessful. In 584, Pelagius sent three letters to the bishops of Istria, in which he intimated that the disputes which divided them were foolish and idle; enlarged on the evils attending a division among the Catholic prelates; exhorted them, with great tenderness, to return to the unity of the church; and proposed a conference, to be held at Rome, or, if more convenient for them, at Ravenna, which he hoped would end to their satisfaction and his. To these letters the Istrian bishops replied in the order in which they received them; but so far were they from making any impression on their minds, that these prelates came to a determination to decline all communication with Rome. Pelagius, finding that he could not succeed in his design by persuasion, resolved to have recourse to persecution. He accordingly wrote to the exarch, exciting his resentment against the Istrian prelates, by representing them to be incorrigible disturbers of the peace of the empire as well as the church. Zamaragdus, instead of following the prudent and humane example of his predecessor Narfes, in the pontificate of Pelagius I., suffered himself to be the tyrannical instrument of papal vengeance, and seized and imprisoned the refractory prelates.

From this period we meet with no farther particulars relating to Pelagius before the year 588, when a council was held at Constantinople, for the trial of Gregory, patriarch of Antioch, who had been accused of incest, and several other very serious crimes. After the patriarch had been honourably acquitted, the council, before it broke up its meeting, confirmed to John of Constantinople, on his own application, the title of œcumenical or universal bishop, to be enjoyed by him, and his successors in that see. Though it does not appear that this title was attended with any accession of power, yet Pelagius was alarmed lest the dignity of his bishopric should be eclipsed, and endeavoured to excite the whole Christian world against John, as if he intended to engross all ecclesiastical power to himself and his see. As much disturbed and concerned as if the council had condemned some fundamental article of the Christian religion, he immediately, by the authority, and in the name of St. Peter, declared all the acts of that assembly null and void, excepting their acquittal of Gregory. He also dispatched messengers

messengers to Constantinople with letters to the patriarch, and to his nuncio at the imperial court; the former he commanded to relinquish the anti-christian title which he had assumed, and the latter he enjoined not to communicate, nor assist in divine service on any occasion with the bishop of Constantinople, till he had renounced that distinction. Notwithstanding this, John probably continued the use of his title as long as he lived, though the pope was prevented, by death, from proceeding farther in this affair. In 589 the Catholic cause received an accession of strength by the conversion of the Gotlis in Spain, who, after having professed the doctrine of Arius during more than two centuries, were persuaded by their king Recaredus to renounce it, and to embrace the Catholic faith. This event gave great satisfaction to the Catholic party, though Pelagius survived but a short time to enjoy it. In consequence of an inundation of the Tiber, which laid the greater part of the city of Rome, and the adjacent country under water, a dreadful distemper broke out, which proved fatal to Pelagius in February 590, after he had presided over the Roman see eleven years and about a quarter. Ten "Letters," and six "Decrees" under his name, are inserted in the fifth vol. of the Collect. Concil.; some of them are, however, supposititious.

PELAGIUS, the distinguished leader of a Christian sect. See PELAGIANS.

PELAGNISI, in *Geography*, an island in the Grecian Archipelago, about eight miles in circumference. N. lat. 39° 30'. E. long. 24° 8'.

PELAGONIA, in *Ancient Geography*, a country of Macedonia, called also "Tripolitis," on account of its three cities, according to Strabo.—Also, a town of the same country.—Also, a town of the island of Sicily.

PELAGOSA, in *Geography*, an island in the Adriatic, near the coast of Dalmatia. This island, and the adjacent rocks, are the remains of an ancient volcano; and its present aspect, which is rugged and ruinous, indicates many violent eruptions; 16 miles S.W. of Agosta. N. lat. 42° 45'. E. long. 16° 10'.

PELAMYS, in *Ichthyology*, a name by which the ancients expressed the young brood of the *thynnus*, or tunny fish, at a certain age and size; but later writers have appropriated the word for the name of a distinct species of fish of the same genus, called by others *sarda*; and by some by the two names joined into one, *pelamys-sarda*. It is a sea-fish, of the shape of the tunny: but of a smooth skin, and free from scales every where, except about the gill-fins; its teeth are large, long, and crooked. These are the only external marks by which it is to be known from the young brood of the tunny; but when brought to the table, it is easily distinguished by the hardness of its flesh.

PELAMYS *Vera*, a name given by Rondeletius, and some other authors, to the fish more distinctly known by the name of *amia*.

PELANG, in *Geography*, a town of the Birman empire; 8 miles N.E. of Pagongmew.

PELANI, Πελανί, among the Athenians, a kind of cakes used in their libations.

PELARGONIUM, in *Botany*, so called from *πελαργός*, a *flork*, in allusion to the beak of the fruit, which resembles the bill of that bird; as well as to preserve an analogy with the *Geranium*, or Crane's bill. The name and the genus were first suggested by Dillenius, in Hort. Elth. 149, and subsequently adopted by Burmann and P'Heritier, as well as by the editors of the first edition of *Hortus Kewensis*. *Pelargonium* embraces what are commonly known by the appellation of African Geraniums, and which doubtless

constitute a most natural genus, clearly distinguished from GERANIUM, as well as from ERODIUM, (see those articles,) by the irregularity of the flower and its tubular neclary, to say nothing of number of stamens.—Burm Afr. 89. L'Herit. Geraniol. unpublished. Ait. Hort. Kew. ed. 1. v. 2. 417. Willd. Sp. Pl. v. 3. 641. Lamarck Illustr. t. 574. (Geranium; Linn. Gen. 350. Schreb. 458. Juss. 268.)—Class and order, *Monadelphica Heptandria*. Nat. Ord. *Gruinales*, Linn. *Gerania*, Juss.

Gen. Ch. *Cal.* Perianth inferior, in five deep, oblong, permanent segments, the uppermost protracted downwards into a honey-bearing tube, running along the flower-stalk, with which it is united. *Cor.* Petals five, oblong or roundish, spreading, longer than the calyx, irregular. *Stam.* Filaments ten, awl-shaped, flat, united at their base into a sort of cup, three of them, rarely five, abortive, and without anthers; anthers seven, rarely but five, oblong, versatile. *Pist.* Germen superior, oblong, with five furrows, beaked; style central, awl-shaped, spirally furrowed, as long as the stamens, permanent; stigmas five, reflexed. *Peric.* Capsules five, aggregate, membranous, obovate, vertical, separating at their inside, pointed at the base, each tipped at its summit with a long, linear, flat, pointed, rigid awn, hairy on its outside, and at length spirally twisted, adhering by its point to the summit of the style. *Seeds* solitary, erect, ovate.

Ess. Ch. Calyx in five deep segments, the uppermost elongated at the base into a nectariferous tube, running down the flower-stalk. Petals five, irregular. Filaments ten, unequal, three or five of them abortive. Fruit beaked, of five aggregate capsules, each tipped with a long spiral awn, bearded on the inside.

This vast and favourite genus, for which we are almost entirely indebted to the Cape of Good Hope, consists of a great number of well-marked species. But that number is greatly augmented, in almost every book, by the admission of spurious hybrid species or varieties, which continually start up from seed wherever many of the primary ones are cultivated, and are for a while propagated by cuttings, or even by seed. Sooner or later, however, they for the most part vanish, even before the eyes of those who witnessed their origin. Willdenow defines 120 species of *Pelargonium*, several of which we know to have been the production of European gardens. He arranges them in eight sections. We shall select examples of each, subjoining such remarks as seem to us necessary, but abstaining from the hazardous and unimportant undertaking of classing, or accounting for, every evanescent variety, with figures of which some authors, otherwise of good credit, have burthened and bewildered the science. All these plants have rather a fleshy habit, and more or less of a peculiar scent, in some instances exquisitely agreeable. Some are herbaceous, with a tuberous root, that supplies the place of the shrubby stem observable in most of the others. Their foliage is mostly downy, sometimes glaucous. Flowers more or less umbellate, rarely endowed with any scent, except what arises from the herbage, though some, whose colours are of the yellowish-green or lurid kind, are deliciously fragrant at night. The prevailing colour, throughout the greater part of the genus, is crimson, scarlet, or light purple, in various beautiful shades and combinations, often intermingled with white. Yellow and blue are both equally rare in this natural order, and the latter scarcely occurs at all in the genus of which we are treating.—Every known species, except perhaps one or two, is perennial. They are greenhouse plants in England, flowering at various seasons, and conducing greatly to the ornament of a collection. In some few instances the number of petals, as well

PELARGONIUM.

well as of the *stamens*, differs a little from the generic description.

Section 1. *Stem wanting. Root turnip-like. Umbel compound.* Twenty-two species in Willdenow.

P. longifolium. Long-leaved Stork's-bill. Willd. n. 1. Jacq. Ic. Rar. t. 518. (*Geranium longifolium*; Burm. Geran. 50. n. 67. t. 2. Cavan. Diff. 235. t. 102. f. 1. *G. prolificum*; Linn. Sp. Pl. 950.)—Stem none. Umbel compound, leafy. Leaves lanceolate, acute, entire, smooth; the older ones pinnatifid, linear. Petals linear-obovate. Anthers four.—Gathered first by Oldenland at the Cape of Good Hope. *Root* ovate-oblong. Radical *leaves* several, on longish stalks, spreading, above two inches long, and near one broad; mostly accompanied by some younger ones, that are deeply pinnatifid, and very narrow. *Flower-stalk* foliary, three or four inches high, bearing about three unequal, downy, partial stalks, accompanied by a leaf or two, each terminating in a downy *umbel*, of several rose-coloured *flowers*. Analogy shews the stalk of this plant to be but a *scapus*, not a true *caulis*, though it generally elevates a leaf or two from the root. It must however be confessed that, like many others in this genus, it forms an intermediate link between a stem and flower-stalk, or rather combines the two.

P. longiflorum. Long-flowered Stork's-bill. Willd. n. 2. Jacq. Ic. Rar. t. 521.—Stem none. Umbel compound, somewhat leafy. Leaves lanceolate, acute, entire. Petals linear. Anthers four.—Of this Jacquin's *depressum*, t. 520, is justly made a variety by Willdenow; and we would venture also to refer to it his *ciliatum*, t. 519, which Willdenow, on account of two little occasional appendages to the leaves, terms *auriculatum*, n. 7.—Perhaps they are all but varieties of *longifolium*, differing in their narrower *petals*, which are buff-coloured, with a deeper purple stain at the base of some of them. The *footstalks* of all are hairy, at least at their base, as are the *umbels* and partial *flower-stalks*. There is a general conformity in their foliage and aspect, which will scarcely allow us to trust to any apparent specific differences, but we offer our sentiments, on so obscure a tribe, in the way of conjecture only.

P. auritum. Eared Stork's-bill. Willd. n. 8. (*Geranium auritum*; Burm. Geran. 47. n. 61. *G. prolificum* δ ; Linn. Sp. Pl. 950. Mant. 433. *G. africanum*, foliis pleurumque auritis, floribus ex rubro purpurascens; Comm. Hort. v. 2. 121. t. 61.)—Stem none. Umbels simple or compound. Leaves ovate-oblong, obtuse, simple or ternate, slightly notched, hairy. Petals obovate, oblong. Anthers five.—Burmah says this is the rarest of all the Cape Geraniums. Linnæus had it in the Upsal garden, as appears by his herbarium. It is nearly allied to the foregoing, but seems altogether more hairy, and the *leaves* are most frequently truly ternate, and obtuse. The *petals* are of a deep crimson. We cannot ascertain the number of *anthers*, but Linnæus says they are five.

To this are nearly allied *hirsutum* of Burmann, n. 68. t. 2. Willd. n. 12, and *heterophyllum*, Jacq. Ic. Rar. t. 516. Willd. n. 15. Both vary much in the division of their *leaves*, but the segments always partake either of a wedge-like or obovate figure, and are by no means linear. They are also constantly hairy.

P. pinnatum. Pinnate Stork's-bill. Ait. Hort. Kew. ed. 1. v. 2. 417. Willd. n. 18. Curt. Mag. t. 579. (*P. astragalifolium*; Jacq. Ic. Rar. t. 511. *Geranium pinnatum*; Linn. Sp. Pl. ed. 1. 677. *G. prolificum* γ ; Linn. Sp. Pl. 950. *G. africanum* astragali folio; Comm. Prælad. 53. t. 3.)—Stem none. Umbels simple or compound. Leaves pinnate; leaflets numerous, ovate, undivided, hairy

on both sides. Anthers five.—Commelin received seeds of this from the Cape about the year 1699. Whatever may be thought of the rest of this tribe, the present plant is certainly a very well marked species. The *leaves* are very like those of several *Astragali*. Sometimes the *leaflets* are placed in fours. The *flower-stalks* are hairy, sometimes simple, but mostly bearing three umbels, with a small leaf or two. The *petals* vary in breadth and colouring, but are generally obovate-oblong, pale buff, or cream-coloured, the two uppermost speckled with red. Anthers five.

P. lutcum. Dwarf Yellow Stork's-bill. (*Geranium lutcum*; Andr. Repof. t. 423.)—Stem none. Umbels mostly simple. Leaves pinnate; leaflets stalked, ovate, acute, divided. Anthers five.—This flowered in 1803, in the collection of Mr. G. Hibbert at Clapham, having been received by him, amongst many other rarities, from the Cape.

We know nothing of it but from Andrews's work, yet we have no doubt of its being distinct from all in Willdenow. The stalked and cloven *leaflets* are very peculiar. Whether they are smooth or hairy is not mentioned, but the figure expresses the former. The numerous *flower-stalks* are all drawn simple and smooth, nor does any pubescence appear on the *umbel* or *calyx*. The *petals* are linear-obovate, of a full yellow; the two uppermost streaked with red. Anthers five.

P. barbatum. Bearded-leaved Stork's-bill. Willd. n. 19. Jacq. Ic. Rar. t. 513. (*Geranium prolificum* β ; Linn. Sp. Pl. 949. *G. proliferum*; Burm. Geran. 51. n. 70. t. 2. Cavan. Diff. 259. t. 120. f. 3.)—Stem none. Umbel compound. Leaves pinnate; leaflets linear-lanceolate, acute, partly three-cleft, bearded at the tips. Anthers five.—This species appears to have been one of the first, of its tribe, brought from the Cape into the European gardens. Linnæus cultivated it with success at Upsal. The narrow, decurrent, frequently three-cleft *leaflets*, and especially the tuft of two or three bristly hairs at the point of each segment, afford its discriminative characters. The *umbels* and their stalks are downy. *Flowers* small and inconspicuous, flesh-coloured with some purple streaks.

P. rapaceum. Turnip-rooted Stork's-bill. Ait. Hort. Kew. ed. 1. v. 2. 418. Willd. n. 22. Jacq. Ic. Rar. t. 510. (*Geranium rapaceum*; Linn. Syst. Nat. ed. 10. v. 2. 1141. *G. prolificum* α ; Linn. Sp. Pl. 949. *G. africanum*, myrrhidis folio, flore albicante, radice rapacæ; Comm. Hort. v. 2. 125. t. 63.)—Stem none. Umbel compound. Leaves pinnate; leaflets doubly pinnatifid, linear, downy. Corolla somewhat papilionaceous.—This used formerly to be known in gardens by the name of the Horfe's head Geranium, in allusion to the remarkable shape of the *flower*, by which alone it is clearly distinguished as a species. Three of the *petals*, much the broadest, cohere like the wings and keel of a papilionaceous flower, and are white or pale blush-coloured; the other two, narrower, rose-coloured and spotted, are reflexed, and look like a divided standard of the same kind of blossom. The *root* is very thick and tuberous, often divided. *Leaves* downy, pinnate; their leaflets doubly pinnatifid, in linear segments, which are variable in length and breadth.—If Linnæus had seen this alive, he could never have confounded it with any other.

Section 2.—*Stem very short. Root tuberous.* Four species.

P. lobatum. Lobe-leaved Stork's-bill. Ait. Hort. Kew. ed. 1. v. 2. 418. Willd. n. 23. (*Geranium lobatum* α ; Linn. Sp. Pl. 950. Cavan. Diff. 250. t. 114. f. 2. *G. africanum*, noctu o'ens, tuberosum, vitis foliis hirsutis; Comm. Hort. v. 2. 123. t. 62.)—Stem scarcely any. Umbel compound. Leaves ternate or quinate; leaflets broad, roundly lobed, crenate, downy beneath. Anthers six.

PELARGONIUM.

fix.—An old plant in the European gardens, yet not very common, flowering in the greenhouse or conservatory in April and May, and highly desirable on account of the nocturnal fragrance of its *flowers*, which is like that of the bergamot pear, though far superior. The *petals* are obovate, and of that dull brownish or tawny green, appropriated to many night-scented flowers, as *Hesperis triflis*, *Cheiranthus triflis*, &c. The *leaves* are a span or more in breadth, soft and downy, acutely crenate. *Flower-stalks* hairy. *Umbels* downy. *Root* much like the last.

P. trifle. Night-scented Stork's-bill. Willd. n. 24. (*Geranium trifle*; Linn. Sp. Pl. 950. Cornut. Canad. 109. t. 110. Cavan. Diff. 261. t. 107. f. 1.)—Stem short. *Umbels* simple. *Leaves* hairy, pinnate; leaflets doubly pinnatifid, in oblong acute segments. *Root* of many jointed knobs—This is so like the last in its *flowers*, that it might be supposed a variety with deeply divided *leaves*, but it is more caulescent, and the *root* differs essentially in being composed of many elliptical jointed knobs, instead of consisting of one great solid body. Cornuti's plate, published in 1635, however misplaced in a work on Canada plants, is we believe the first that appeared of any African *Geranium*, or *Pelargonium*, and has also great merit in the execution. He says the *roots* are eatable.

P. flavum. Carrot-leaved Stork's-bill. Willd. n. 26. (*P. daucoides*; Jacq. Ic. Rar. t. 522. *Geranium flavum*; Linn. Mant. 257. *G. daucifolium*; Cavan. Diff. 260. t. 120. f. 2. *G. africanum, folio staphylini*; Riv. Pentap. Irr. t. 107.)—Stem short. *Umbels* simple. *Leaves* hairy, repeatedly subdivided, in linear-lanceolate segments. *Root* of many jointed knobs.—This we are persuaded is but a variety of the last, with more divided and narrower *leaves*, though Willdenow inserts, between the two, a most distinct species, which is the following.

P. appendiculatum. Broad Stipulaceous Stork's-bill. Willd. n. 25. (*Geranium appendiculatum*; Linn. Suppl. 304. Cavan. Diff. 262. t. 121. f. 2.)—Stem scarcely any. *Flower-stalks* angular. *Leaves* doubly pinnate, hairy. *Stipulas* dilated, rounded, coriaceous, ribbed, united with the base of the footstalks.—It does not appear from whom Linnæus received his wild African specimens of this very singular species, which we have not heard of in any garden. The remarkable *stipulas*, often an inch wide, at once distinguish the plant. Perhaps it ought to stand in the first section, as more akin to several there to be found, than to the *trifle* and its allies.—The *root* is nearly globose. *Leaves* nearly all radical, three or four inches long, extremely hairy, finely divided. *Flower-stalks* hairy, rather taller than the leaves, divided a little above the base into two angular, strongly furrowed branches, each bearing a hairy *umbel* of many smallish rose-coloured *flowers* on long stalks. The specimen figured by Cavanilles is the very counter-part of the Linnæan ones, and having been sent by Thunberg, we may presume they were all gathered by him, and that no other botanist has met with this remarkable plant.

Section 3. *Stem elongated, herbaceous, or somewhat shrubby.*
Twenty-six species.

P. anotheræ. Evening-primrose Stork's-bill. Willd. n. 27. Jacq. Ic. Rar. t. 525. (*Geranium anotheræ*; Linn. Suppl. 305.)—*Umbels* of about three flowers. *Leaves* opposite, lanceolate, obtuse, with tooth-like serratures, very finely downy on both sides. *Stem* ascending, herbaceous.—Jacquin at first mistook this for *G. ovatum* of Cavanilles; see our next-mentioned species. We have not seen it in any garden. The Linnæan specimen seems to be one of those brought from the Cape by Thunberg, which his venerable

preceptor was just able to contemplate with satisfaction, but not to describe. The *stem* is divided into several herbaceous branches, a span long, spreading, and partly decumbent. *Leaves* on long stalks, oblong-lanceolate, deeply and unequally serrated. Whole *plant* clothed with dense, soft pubescence, like some kinds of *Anothera*. *Flowers* two or three in each *umbel*, nearly regular, smallish, rose-coloured. *Fruit* large, with a downy beak.

P. ovale. Oval Hoary Stork's-bill. Willd. n. 29. L'Herit. Geran. t. 28. (*G. ovatum*; Cavan. Diff. 238. t. 103. f. 3.)—*Umbels* of about four flowers. *Leaves* ovate, acute, strongly serrated, hoary. *Stem* trailing. *Anthers* seven. Resembles the last in general habit, but differs in the shape of the *leaves*, and their much longer stalks. The *flowers* are much larger, and rather more numerous in each *umbel*; *fruit* smaller. *Anthers* seven, though Cavanilles says five; but as he saw only dried specimens, we presume he might easily mistake this point, and we rather refer his synonymy to this species, than to the *eriosleman*, under which Willdenow has doubtfully cited him.

P. eriosleman. Woolly-filament Stork's-bill. Willd. n. 32. Jacq. Hort. Schonbr. v. 2. 4. t. 132.—*Umbels* of about four flowers. *Leaves* elliptical, obtuse, crenate, finely downy. *Stem* erect. *Upper petals* notched. *Stamens* woolly. *Anthers* five.—This species has been much misunderstood. Burmann himself sent it to Linnæus, doubting whether it were distinct from his own *G. ovale*, Prodr. Cap. 19; and Linnæus, far more unaccountably, supposed it a variety of his *G. malacoides*, while his son guessed it to be *betulinum*! The specimen however is rightly marked as having but five anthers. The erect though humble *stem*, and obtuse closely crenate *leaves*, at once distinguish it from the last. The *petals* are white; the two uppermost broad, acutely notched, spotted with crimson at the base. *Anthers* and *style* red.

P. stipulaceum. Narrow Stipulaceous Stork's-bill. Willd. n. 34. (*Geranium stipulaceum*; Linn. Suppl. 306. Cavan. Diff. 254. t. 122. f. 3.)—*Umbels* of about three flowers. *Leaves* heart-shaped, cut and crenate, slightly hairy. *Stem* short, gibbous, somewhat jointed. *Stipulas* awl-shaped, rigid, permanent.—Thunberg found this at the Cape, and gave it to Linnæus, as well as to Cavanilles. The *stem* is very remarkably tumid, fleshy, and jointed, subdivided, though of humble growth, each joint beset with numerous, rigid, thorn-like, permanent *stipulas*. The *leaves* are few, stalked, heart-shaped, and obtuse, variously cut and lobed, paler beneath, clothed on both sides with short scattered hairs; their length about an inch. *Flower-stalks* three or four inches long, pale, nearly smooth, umbellate. *Flowers* three or four, small. *Fruit* with a hairy beak.

P. tabulare. Rough-stemmed Stork's-bill. Willd. n. 36. L'Herit. Geran. t. 9. (*Geranium tabulare*; Linn. Sp. Pl. 947. excluding Burmann's syn. *G. elongatum*; Cavan. Diff. 233. t. 101. f. 3.)—*Umbels* three-flowered. *Leaves* kidney-shaped, five-lobed, notched, slightly hairy. *Stem* ascending, rough with deflexed bristles.—Native of the Cape of Good Hope, but whether of the Table Mountain, as its name implies, is very doubtful, so many things having been confounded under this name. We are however certain of L'Heritier's plant, on his own authority, though his figure does not well express the peculiar character of the coarse bristles of the *stem*, inclined rather downwards. The original specimen of Linnæus is the same. But *G. tabulare* of Burmann and Cavanilles is extremely different, being Willdenow's *P. faniculifolium*, n. 75, and, if we mistake not, *variegatum*, n. 78.

The true *tabulare* is not one of the most ornamental kinds,
and

PELARGONIUM.

and therefore cultivators are apt to neglect it. The *root* is perennial and woody. *Stems* weak and tender, often dying down to the ground, distinguished by their peculiar hairiness. *Leaves* on long stalks, dull green, scarcely marked with any concentric shade or zone, but besprinkled with shining tawny hairs. *Umbels* of about three small, very pale flesh-coloured yellowish *flowers*, on very long smooth stalks, opposite to the leaves. *Calyx* hispid. *Petals* narrow. *Anthers* five. *Style* elongated beyond the beak, before it divides into *stigmas*.

P. alch. milloides. Lady's-mantle-leaved Stork's-bill. Willd. n. 37. (*Geranium alchemilloides*; Linn. Sp. Pl. 948. Cavan. Diff. 234. t. 98. f. 1. *G. africanum*, folio alchimillæ maculato; Riv. Pentap. Irr. t. 104.)—Umbels of about four flowers. Leaves kidney-shaped, deeply five-lobed, cut, very hairy. Stem diffuse, rough with deflexed bristles. *Stigmas* sessile.—Very near the last, but well distinguished in the Hortus Kewensis, by the *stigmas* being sessile, without any elongation of the *style* beyond the hairy beak. The *stem* is very hairy with deflexed bristles, the *flower-stalks* with spreading ones. *Leaves* more hairy than in *P. tabulare*, often marked with a purplish zone; their lobes more straight and deep, coarsely cut at the extremity.

The younger Linnæus confounded with this a very curious and little-known species, *P. articulatum*, Willd. n. 35, adopted by that writer from Cavanilles, who has correctly figured it, t. 122. f. 1. Willdenow has no less judiciously placed it between *P. stipulaceum* and *tabulare*. The base of the *stem* is jointed and swollen, clothed with permanent, membranous, somewhat spinous *stipulas*, resembling *stipulaceum*; but the rest of the *stem*, as well as the *foliage*, are nearly akin to *tabulare* and *alchemilloides*. The *flowers* are larger than in either, apparently yellowish, their two larger *petals* streaked with purple.

P. odoratissimum. Nutmeg-scented Stork's-bill. Willd. n. 38. (*Geranium odoratissimum*; Linn. Sp. Pl. 948. Cavan. Diff. 241. t. 103. f. 1. *G. africanum humile*, folio fragrantissimo molli; Dill. Elth. 157. t. 131.)—Umbels of about five flowers. Leaves roundish-heart-shaped, crenate, very softly downy.—This species is known by the delicate softness of its *leaves*, and their highly aromatic and powerful smell, which is renewed by rubbing, even after the plant has been dried twenty years or more. For this scent it is chiefly valued, the *flowers* being small, whitish and inconspicuous. The coarse engraving of Dillenius is more truly excellent, as expressing the soft habit of the plant, than many a fine coloured plate probably would have been.

We doubt much whether *G. africanum*, Cav. Diff. 242. t. 104. f. 1, can be a variety of this, though it is so considered by Willdenow. The *flowers* are five times as large, and *leaves* more hairy. The specific name is truly unfortunate, as applying equally to this whole genus.

P. alceoides. Musk-mallow-leaved Stork's-bill. (*P. columbinum*; Jacq. Hort. Schonbr. v. 2. 4. t. 133. Willd. n. 42. *Geranium alceoides*; Linn. Sp. Pl. 948. *G. folio alceæ tenuitè laciniato*, flore pentapetalo purpurascente, femine tenui; Marr. Cent. 16. t. 16.)—Umbels many-flowered. Leaves ternate, deeply three-cleft, lacinated. Stem herbaceous, decumbent, hairy. Nectary shorter than the segments of the calyx.—This has the aspect of an European rather than a Cape Geranium, and the shortness of its nectariferous tube combines with the habit, to bring it very near *Erodium*. As however that tube is present, no doubt can remain of the genus. Jacquin, who raised the

plant from Cape seeds, and kept it flowering throughout the winter in his stove, was not aware of its being a Linnæan species, concerning which the herbarium of Linnæus removes all doubt. We cannot therefore submit to the alteration of its very expressive specific name. The fertile *filaments* are usually five, though it seems one of them occasionally wants its *anther*. The *petals* are small, purple; the two uppermost prettily marked with an eye-like spot.

P. tricolor. Three-coloured Stork's-bill. Curt. Mag. t. 240. Willd. n. 45. (*P. violaceum*; Jacq. Ic. Rar. t. 527.)—Umbels three-flowered. Leaves oblong, bluntish, hoary, cut and somewhat pinnatifid, obscurely three-lobed. Two upper petals glandular at the base.—Seeds of this were sent by Mr. Masson from the Cape to Kew garden in 1792. It was first published by Mr. Curtis, and is a favourite plant in collections, though not one of the easiest to preserve. We notice it here chiefly for its singular beauty. The *petals* are roundish and nearly uniform in shape, but very different in colour. The three lowermost are usually milk-white, rarely striped slightly with red; the two uppermost of a most rich and deep blood red, darkly veined, with a velvet-like reflection, their base almost black, beset with shining glandular points. *Seeds* are rarely produced in England, yet the species is very distinct and permanent.

P. coriandrifolium. Coriander-leaved Stork's-bill. Willd. n. 50. Jacq. Ic. Rar. t. 528. (*Geranium coriandrifolium*; Linn. Sp. Pl. 949. Cavan. Diff. 263. t. 116. f. 1. *G. africanum*, foliis coriandri; Riv. Pentap. Irr. t. 108.)—Umbels of about three flowers. Leaves bipinnate; leaflets pinnatifid, linear. Anthers five. Petals usually four. Stem herbaceous, roughish.—An old inhabitant of greenhouses, whose *stem* is diffuse, herbaceous, and usually annual, though the *root*, if properly preserved, is, as at the Cape, its native country, perennial. The finely divided *leaves*, and the large *flowers*, make this worth cultivating for variety. The two upper *petals* are much the largest, obovate, and veined with purple; the three lower, of which the middlemost is generally wanting, are narrow, and pure white.

Section 4. *Stem shrubby. Leaves neither divided nor angular.* Four species.

P. glaucum. Glaucous Spear-leaved Stork's-bill. L'Herit. Geran. t. 29. Willd. n. 53. (*Geranium glaucum*; Linn. Suppl. 306. *G. lanceolatum*; Cavan. Diff. 235. t. 102. f. 2. Curt. Mag. t. 56.)—Stalks mostly single-flowered. Leaves lanceolate, entire, pointed, smooth, glaucous.—This, one of the most singular of its genus in foliage, was raised by the late Mr. Lee, from seeds picked out of Cape specimens at sir Joseph Banks's, about the year 1775. Great disputes have always existed concerning the specific name, *glaucum* as well as *lanceolatum* being each so strikingly opposite, that the first which is heard seems entitled to bear down all opposition. That given by Linnæus himself, and published by his son, has however prevailed. So glaucous are the *leaves*, even in a dry state, that they appear to have been white-washed. Their form is lanceolate, inclining to obovate, with a point; their length nearly two inches. The *stem* is shrubby and branched, angular, glaucous with a purple tinge. *Footstalks* stout, angular, from one to three inches long, connected with the *leaf* by a joint, and both together are nearly upright. *Stipulas* in pairs, lanceolate, acute. *Flower-stalks* axillary, bearing one, rarely two, elegant *flowers*, whose partial stalk is often longer than the general one, and accompanied, nearly all the way to its base, by the nectariferous tube. *Petals* obo-

PELARGONIUM.

vate, of a delicate blush-colour, with crimson veins. This species is increased readily by cuttings, like most of the shrubby kinds.

P. betulinum. Birch-leaved Stork's-bill. Willd. n. 55. Curt. Mag. t. 148. (*Geranium betulinum*; Linn. Sp. Pl. 946. *G. frutescens*, &c.; Burm. Afr. t. 33. f. 1, 2.)—Umbels of about three flowers, downy. Leaves ovate, unequally serrated, nearly smooth.—A handsome well-named species, of which both the varieties, figured by Burmann, are common in every collection, the larger one being preferred. The flowers are pale pink, their upper petals obovate, near an inch long, richly veined with purple. *Nectary* rather short.

P. acetosum. Sorrel-leaved Stork's-bill. Willd. n. 56. Curt. Mag. t. 103. (*Geranium acetosum*; Linn. Sp. Pl. 947. Cavan. Diff. 239. t. 104. f. 3.)—Umbels of about three flowers, smooth. Leaves roundish-obovate, crenate, smooth. Petals linear. The Dutch brought this very early from the Cape, and it has long been generally dispersed throughout Europe. Its perfect smoothness; the somewhat glaucous hue, rounded undivided shape, and acid flavour of the leaves; with the narrow petals, which are flesh-coloured, with straight pink veins, clearly distinguish the *P. acetosum*. Miller speaks of a variety with scarlet flowers, to which we have seen some near approaches.

Section 5. *Stem shrubby. Leaves either angular, lobed, or palmate.* Thirty-seven species.

P. hybridum. Hybrid Stork's-bill. Willd. n. 59. (*Geranium hybridum*; Linn. Mant. 97. Cavan. Diff. 239. t. 105. f. 2. *G. africanum arborescens*, *malvæ folio pingui*, varietas; Dill. Elth. 152. t. 125. f. 152.)—Umbels many-flowered. Leaves roundish, crenate, nearly smooth, slightly lobed, unspotted. Petals obovate-oblong, broader than the segments of the calyx. Dillenius says this was produced from seed of *P. inquinans*, hereafter mentioned, and he points out its resemblance, in many points, to the *acetosum*. Linnæus therefore called it *hybridum*. He might have applied a similar name to several others, had he lived to cultivate many of the new-discovered species. The present, whether a real mule, or a permanent intermediate species, has remained for a long course of years in the gardens, being chiefly, if not entirely, increased by cuttings. The stem is smooth. Leaves very like the *acetosum*, but broader, obscurely lobed, and in some degree downy. Flowers of a scarlet red, with much broader petals than the last, but longer than those of the *inquinans*.

P. zonale. Horse-shoe Stork's-bill. Willd. n. 60. (*Geranium zonale*; Linn. Sp. Pl. 947. Cavan. Diff. 230. t. 98. f. 2. *G. africanum arborescens*, *alchimillæ hirsuto folio*, floribus rubicundis; Comm. Præl. 51. t. 1.)—Umbels many-flowered. Leaves heart-shaped, rounded, slightly lobed, toothed, roughish, marked with a concentric zone.—The most popular of all the species, which the Dutch originally obtained from the Cape, in 1700, and whose many varieties are the ornament of every greenhouse and conservatory. Their copious rose-coloured flowers, produced in plentiful succession, are very showy; their leaves are always distinguished by a dark concentric transverse stripe, various in breadth and intensity, and there is a common, but less luxuriant kind, whose foliage is blotched with white or yellow, and whose petals are narrower than in some of the rest.

P. inquinans. Scarlet Stork's-bill. Willd. n. 61. (*Geranium inquinans*; Linn. Sp. Pl. 945. Cavan. Diff. 243. t. 106. f. 2. *G. africanum arborescens*, *malvæ folio pingui*, flore coccineo; Dill. Elth. 151. t. 125. f. 151. *G. afr. arbor. malvæ*

folio lucido, flore elegantissimo kermesino; Mart. Cent. 3. t. 3.)—Umbels many-flowered. Leaves orbicular-kidney-shaped, slightly lobed, crenate, downy and viscid.—Martyr says this splendid species was first brought into England about the year 1718. It soon became common, and is justly admired for the vivid scarlet of its copious flowers. The greatest peculiarity of this *Pelargonium* is that which its name expresses, of staining the finger with a greasy red moisture, exuding from the whole surface of its soft downy branches. There are several varieties, differing in the magnitude or splendour of their flowers. This is supposed to be the mother, *acetosum* the father, of *P. hybridum* above described.

P. heterogamum. Lady Coventry's Stork's-bill. Ait. Hort. Kew. ed. 1. v. 2. 424. Willd. n. 62. L'Herit. Geran. t. 18.—Umbels many-flowered. Leaves orbicular-kidney-shaped, acutely lobed and toothed, hairy. Stem rough with deflexed bristles.—This should seem to have been produced between the last-mentioned and *P. alchemilloides*, Willd. n. 37. The pubescence and leaves much resemble the latter; the scarlet flowers, and upright shrubby stem, accord with the former. It is allowed on all hands to be a hybrid plant, and, as Mr. Lee informs us, originated in Lady Coventry's greenhouse. The anthers are six. Stigmas elevated on a short simple style, above the hairy beak; not sessile, as in *alchemilloides*.

P. peltatum. Ivy-leaved Stork's-bill. Willd. n. 65. (*Geranium peltatum*; Linn. Sp. Pl. 947. Mill. Ic. t. 140. Curt. Mag. t. 20.)—Umbels of few flowers. Leaves five-lobed, entire, fleshy, smooth, more or less peltate. A common plant in every greenhouse and window, having been early introduced from the Cape, nor can it be confounded with any other, on account of the five-lobed, dark, shining, ivy-like leaves. The flowers are rose-coloured and handsome. The insertion of the footstalk is usually peltate, or a little way from the base of each leaf. We are however convinced by our own observation, and the practical authority of Mr. Lee, that *P. lateripes*, Willd. n. 66. L'Herit. Geran. t. 24. which differs in this respect from the common *peltatum*, and has moreover less angular branches, is nevertheless but a variety, and not a very permanent one.

P. tetragonum. Square-stalked Stork's-bill. Willd. n. 67. L'Herit. Geran. t. 23. Curt. Mag. t. 136. (*Geranium tetragonum*; Linn. Suppl. 305. Jacq. Ic. Rar. t. 132. Cavan. Diff. 231. t. 99. f. 2. *G. trigonum*; Scop. Del. Infubr. v. 1. 12. t. 5.)—Stalks two-flowered. Branches fleshy; quadrangular. Petals four.—Sent from the Cape by Mr. Masson, in 1774. The smooth, fleshy, somewhat jointed stem, with three or four prominent angles; small, rounded, lobed, notched leaves, besprinkled with long hairs, and sometimes beautifully variegated with rose-colour and white, as in Curtis's figure, strikingly mark this species. The flowers are no less peculiar and very handsome; their two upper petals are near one inch and a half long, obovate, reflexed, pale pink with branched crimson veins; two lower small and white, the middle one being wanting. Stamens crimson, with seven anthers. Its succulent nature renders it rather more difficult of cultivation than some others.

P. cucullatum. Hollow-leaved Stork's-bill. Willd. n. 69. (*Geranium cucullatum*; Linn. Sp. Pl. 946. Cavan. Diff. 241. t. 106. f. 1. *G. africanum maximum*; Riv. Pentap. Irr. t. 98.)—Umbels many-flowered. Leaves kidney-shaped, hooded, slightly scolloped, finely toothed. A large and showy species, well known in gardens, remarkable for its greyish hoary aspect; rounded, tunnel-like, scarcely lobed leaves; and copious, hairy umbels, of large purple flowers, whole

PELARGONIUM.

whose two upper *petals* are finely pencilled, and marked with a dark central spot.

P. angulosum. Angular Hoary Stork's-bill. Ait. Hort. Kew. ed. 1. v. 2. 426. Willd. n. 70. (*Geranium acerifolium*; Cavan. Diff. 243. t. 112. f. 2. *G. africanum arborescens*, foliis cucullatis angulosis; Dill. Elth. 155. t. 129. *G. afr. arbor. ibisei folio anguloso, floribus amplis purpureis*; Mart. Cent. 28. t. 28.)—Umbels many-flowered. Leaves rounded, hooded, angular, toothed.—This perhaps is still more frequently met with in gardens than the last, of which we are disposed to think it a mere variety, differing only in the acute angles of the *leaves*, and their rather more coarse or unequal teeth. Some experienced cultivators are of our opinion. Linnæus did not even distinguish the present plant as a variety, but the former is the genuine *cucullatum* of his herbarium.

P. variegatum. Variegated Glauous Stork's-bill. Willd. n. 78. *P. lanculæfolium*; Willd. n. 75. *P. cortusæfolium*; Jacq. Ic. Rar. t. 539. *Geranium variegatum*; Linn. Suppl. 305. Cavan. Diff. 251. t. 118. f. 3? *G. tabulare*; Burm. Geran. 36. n. 44. t. 1. Cavan. Diff. 232. t. 100. f. 2.)—Umbels of about five flowers. Leaves palmate, five-lobed, flat, glaucous, smooth, sharply toothed. Stipulas heart-shaped. *Nectary* not longer than the calyx.—We feel little reluctance in combining all the above synonyms under one species. The Linnæan *G. variegatum* appears to have been little known to any body, and was rendered more obscure by the doubtful and imperfect figure in Cavanilles, which has only two flowers on a stalk, and shews nothing of the length of the nectariferous tube. The Linnæan specimen has four or five *flowers* in each *umbel*, and answers exactly to Jacquin's t. 539, except that the *leaves* are rather more deeply lobed, without any appearance of a zone, at least in a dried state. The *flowers* appear by Jacquin's figure to vary in size, and Burmann's *tabulare* exhibits them of still smaller dimensions, perhaps because his plate was taken from a dry specimen. This species therefore, known in our gardens by the name of *saniculæfolium*, but which ought to retain its original appellation, *variegatum*, is readily distinguished by being perfectly smooth and glaucous, with numerous round *branches*. *Leaves* on long spreading *stalks*, more or less deeply five-lobed, the middle lobe often three-cleft, and all of them sharply cut or serrated. Most generally, as it seems, the disk is marked with a brown or purplish, concentric, broken zone. The *stipulas* are of a broad-ovate or heart-shaped form, and vary in size. *Umbels* on very long stalks, opposite to the *leaves*, of four or five handsome *flowers*. *Calyx* with a few bristly hairs about the base, well expressed by Jacquin, its segments full as long as the nectariferous tube, whose termination is very evident. Two upper *petals* large, obovate, rose-coloured, with a purple central spot, and many dark veins; three lower ones linear and whitish.

Very possibly *P. fuscum*, Jacq. Ic. Rar. t. 540. Willd. n. 74, may be but a slight variety of *variegatum*. Its *branches* are said to be rough when young.

P. grandiflorum. Large-flowered Glauous Stork's-bill. Willd. n. 77. (*Geranium grandiflorum*; Andr. Repof. t. 12.)—Umbels of two or three flowers. Leaves palmate, five-lobed, flat, glaucous, smooth, sharply toothed. Stipulas ovate. *Nectary* thrice as long as the calyx.—Mr. Masson is said to have sent this species from the Cape in 1792. It is justly admired for the size and beauty of its *flowers*, which are only two or three on each stalk, and essentially distinguished from *variegatum* by the great length of their nectariferous tube, which is about two inches, being thrice that of the *calyx*. The *petals* are white; the two uppermost elegantly stained with rose-colour; the rest narrower,

and rather shorter. The *leaves*, and whole habit, exactly agree with our specimen of *variegatum*; but the *stipulas* are more rounded, or obovate, not heart-shaped. The plate of Cavanilles, done for the last, may very probably have been taken from a specimen of the present species. We suspect moreover that *P. patulum*, Jacq. Ic. Rar. t. 541. Willd. n. 76, is but too nearly related to this, though, having seen no specimen, we cannot speak with confidence.

P. cotyledonis. Peltate Downy Stork's-bill. Willd. n. 79. L'Herit. Geran. t. 27. (*Geranium cotyledonis*; Linn. Mant. 569.)—Umbels compound. Leaves heart-shaped, peltate, rugged, molt downy beneath. Stem fleshy, without thorns.—This is one of the very few species which do not readily blossom in gardens. We never saw the *flowers*, nor did Linnæus, Cavanilles, nor Willdenow. The plant was brought to England from Holland in 1768, according to Mr. Fairbairn, but the Hort. Kew. says it is a native of St. Helena, and was introduced in 1765, by Mr. John Bush. It is however allowed to be likewise a Cape species. The *stem* is peculiarly thick and fleshy, each branch crowned with a number of stalked, peltate, rounded, slightly lobed *leaves*; finely reticulated, corrugated, and minutely downy above; veiny, and clothed with soft, dense, hoary pubescence beneath. L'Heritier's fine plate represents the *flower-stalk* a foot high, hairy, repeatedly compound, bearing several *umbels*, of about four *flowers* each. The *petals* are roundish, and nearly uniform. *Nectary* very short.

P. cchinatum. Prickly-stalked Stork's-bill. Curt. Mag. t. 309. Willd. n. 80. (*P. hamatum*; Jacq. Hort. Schönbr. v. 2. 7. t. 138.)—Umbels many-flowered. Leaves roundish-heart-shaped, lobed, crenate, soft, densely downy beneath. Stem fleshy. Stipulas permanent, spinous.—Somewhat similar to the last, but abundantly distinct, having simple *umbels*; *leaves* softer, neither peltate nor rugose, and the *stem* armed with strong, conical, curved thorns, originating from the permanent *stipulas*. The *petals* are inversely heart-shaped, nearly regular, pure white, sometimes purple, two of them beautifully striped and spotted with that colour. *Nectary* running down almost to the very base of each partial flower-stalk. Curtis and Jacquin described this plant unknown to each other. It is not yet become common, though both singular and ornamental.

P. australe. Botany-bay Stork's-bill. Willd. n. 81.—Umbels many-flowered, capitate. Leaves heart-shaped, crenate, slightly lobed; most downy beneath. *Nectary* very short.—Native of New South Wales.—This is one of those species found in New Holland, and not at the Cape of Good Hope, all which have a general resemblance among themselves, and are not much like any of the African species, except perhaps *althæoides*, Willd. n. 41, and *capitatum*, n. 83, hereafter described. Their habit is downy; *flowers* generally small, pale purple, in numerous, dense, hairy *umbels*; *leaves* heart-shaped, crenate, but slightly lobed; *nectary* very short. We hope to see them well distinguished in the second part of Mr. Brown's Prodromus. In the mean while we would remark that Willdenow's n^o 40, *anceps*, Jacq. Coll. v. 4. 184. t. 22. f. 3, is one of these New Holland species, and not, we believe, found in Africa. It is less hairy than the rest, but not entirely smooth. As far as we know this tribe, they have none of the aromatic scent, usual in their genus, nor much beauty. We have specimens of four very distinct ones from Port Jackson.

P. capitatum. Rose-scented Stork's-bill. Willd. n. 83. (*Geranium capitatum*; Linn. Sp. Pl. 947. Cavan. Diff. 249. t. 105. f. 1. *G. africanum, folio malvæ*; Riv. Pentap. Irr. t. 99.)—Umbels many-flowered, capitate. Leaves heart-shaped, lobed, wavy, crenate, soft and downy. Stem diffuse.

PELARGONIUM.

diffuse. Nectary very short.—The old favourite rose-scented Stork's-bill was among the first brought from the Cape, and is still preserved in collections, though far less frequently than formerly. The delicate scent of rose-water, which its herbage exhales when touched, is less powerful than that of the *graveolens*, of which we shall presently speak. The flowers are pale purple, with dark veins, and, having very short partial stalks, are crowded into a dense head. One of our New Holland species agrees with them in this respect, and vies with them in size. Indeed though L'Heritier distinguished the latter by the name of *P. extraneum*, we can scarcely think it different from *capitatum*, and if we are right, the species before us is therefore a native of New South Wales as well as of southern Africa.

P. tomentosum. Penny-royal Stork's-bill. Willd. n. 86. Jacq. Ic. Rar. t. 537. Curt. Mag. t. 518.—Umbels many-flowered, somewhat panicled. Leaves heart-shaped, five-lobed, rather hastate, ferrated, very soft and downy. Nectary very short.—Remarkable for its strong scent, like pepper-mint or penny-royal. It has been introduced from the Cape, since the first edition of Hort. Kew. was published. The stem is much branched, widely spreading and brittle. Flowers numerous, but not showy, white, with crimson lines, and *filaments* of the latter colour.

P. graveolens. Ottar of rose Stork's-bill. Willd. n. 89. L'Herit. Geran. t. 17. (Geranium terebinthinaceum; Cavan. Diff. 250. t. 114. f. 1.)—Umbels many-flowered, capitate. Leaves palmate, seven-lobed, their segments oblong, obtuse; revolute and very rough at the margin. Nectary about half as long as the calyx. Our readers would hardly recognise, under the names of *graveolens* and *terebinthinaceum*, the deliciously fragrant "Ottar of rose Geranium," as it is commonly called, which has supplanted the old *capitatum*, being far more powerful, though perhaps less delicate, in its scent. This perfumed kind, however, though now so common, is, it seems, but a variety of one less agreeable, and is first mentioned as such by Cavanilles. The shape of the leaves readily distinguishes this *Pelargonium* from every other. If we were to indulge our imagination in guessing at hybrid species, the present might be supposed an offspring of *capitatum*, impregnated by *Radula*, and that its scent varies according as it partakes more of the constitution of one parent or the other. We find it not much inclined to produce seeds. Willdenow mentions a rose-scented variety of *Radula*, impregnated by *graveolens*, and a less agreeable one of *graveolens* impregnated by *Radula*.

P. Radula. Rap-leaved Stork's-bill. Willd. n. 92. L'Herit. Geran. t. 16. (Geranium Radula; Cavan. Diff. 262. t. 101. f. 1. G. revolutum; Jacq. Ic. Rar. t. 133.)—Umbels of few flowers. Leaves digitate, doubly pinnatifid, toothed, linear, revolute, very rough. Nectary nearly as long as the calyx.—Introduced from the Cape in 1774, and now frequent in collections. The narrow linear segments of the deeply divided rough leaves, and their strong mint-like scent, are enough to determine this species, of which we greatly suspect Willdenow's *asperum*, n. 90, and *denticulatum*, n. 93, to be varieties.

Section 6. *Stem shrubby. Leaves either three-cleft or ternate.*
Seventeen species.

P. bicolor. Two-coloured Stork's-bill. Willd. n. 94. Curt. Mag. t. 201. (Geranium bicolor; Jacq. Hort. Vind. v. 3. 23. t. 39. Cavan. Diff. 248. t. 111. f. 1.)—Umbels many-flowered. Leaves heart-shaped, deeply three-cleft, wavy, hairy; their segments obtuse, three-lobed, cut and toothed. Nectary nearly as long as the flower-stalk.—The native country of this elegant species seems not to have

been ascertained, for we do not find its name in Thunberg's long list of Cape Geraniums, nor has it been heard of but in gardens. Jacquin and Curtis say the seeds are scarcely ever perfected; yet we know not to what particular kinds it is sufficiently allied for us to guess at its hybrid birth. The petals are deep crimson, with a white edge, not unlike the pretty *Silene quinquevulnera*. The leaves are sometimes so deeply divided as to become ternate.

P. scabrum. Rough Stork's-bill. Willd. n. 96. L'Herit. Geran. t. 31. Jacq. Ic. Rar. t. 542. (Geranium scabrum; Linn. Sp. Pl. 946. Burm. Geran. 34. n. 39. t. 1. Cavan. Diff. 247. t. 108. f. 1.)—Umbels of few flowers. Leaves wedge-shaped, deeply three-cleft, acute, coarsely ferrated, rough. Nectary the length of the calyx. Messrs. Kennedy and Lee are said to have introduced this from the Cape in 1775. Its shrubby, much branched stem, as well as the leaves, are extremely harsh to the touch, especially in wild specimens, whence Burmann chose the name. The segments of the foliage vary in breadth. The scent is not remarkable. The flowers are rose-coloured and variegated, but few, small, and inconspicuous, nor is the plant entitled to such general favour as many others.

P. crispum. Curled-leaved Lemon Stork's-bill. Willd. n. 99. L'Herit. Geran. t. 32 and 33. (Geranium crispum; Linn. Mant. 257. Cavan. Diff. 252. t. 109. f. 2. G. hermännifolium; Linn. Suppl. 305. Herb. Linn.)—Stalks one or two-flowered. Leaves stalked, two-ranked, roundish-heart-shaped, three-lobed, wavy, plaited, toothed, rough. Stipules heart-shaped. Nectary the length of the calyx.—A pretty species, sent from the Cape by Mr. Masson, in 1774, and valued more particularly for its lemon-scent, resembling that of *Verbena triphylla*. There are two varieties, one with leaves about half an inch in diameter, the other above an inch; in both they are three-lobed, more than half way towards the base, and stand on footstalks about their own length, occasionally more or less. Flowers large in proportion, rose-coloured, with a purple-eye-like spot on each of the broad upper petals, standing, usually solitary, on long slender, axillary stalks, about the upper part of the branches. The ribs of the leaves, especially in wild specimens, are extremely rough, with minute hooked bristles. The larger-leaved variety has more generally two, or even three, flowers on a stalk.

P. hermännifolium. Hermannia-leaved Stork's-bill. Willd. n. 100. Jacq. Ic. Rar. t. 545. (Geranium hermännifolium; Linn. Mant. 569. Cavan. Diff. 240.)—Stalks two-flowered. Leaves sessile, two-ranked, wedge-shaped, slightly lobed, wavy, plaited, toothed, rough. Stipules heart-shaped. Nectary rather longer than the calyx.—The Linnæan herbarium has no specimen of this species, nor do we know it but from the books quoted. It seems to differ from the last chiefly in the want of footstalks.

P. adulterinum, Willd. n. 101. L'Herit. Geran. t. 34, a soft-leaved plant, is acknowledged to be a hybrid production, and we are disposed to doubt whether *femitrilobum*, Jacq. Hort. Schonbr. v. 2. 3. t. 130, notwithstanding Willdenow's opinion, be more than a variety of some of the last described species, but we have not examined specimens of either.

P. fulgidum. Celandine-leaved Stork's-bill. Willd. n. 104. (Geranium fulgidum; Linn. Sp. Pl. 945. Cavan. Diff. 253. t. 116. f. 2. G. africanum folio alceæ, flore coccineo fulgidissimo; Dill. Elth. 156. t. 130.)—Umbels in pairs, many-flowered. Leaves downy, in three deep segments; the middle one largest; all pinnatifid and cut. Calyx oblique. Nectary pouched at the base.—An old, but rather tender, and not very common, species in our greenhouses or stoves, distinguished

PELARGONIUM

distinguished from all others by the intense brilliant scarlet of its *petals*, to which we know nothing comparable in the vegetable kingdom. The *flowers* however are inelegant in form, far from abundant, and the whole plant rather unsightly, like something starved or abortive. The *nectary* is not quite so long as its flower-stalk; its base inflated and almost globose; its top funnel-shaped; hence the segments of the *calyx* are turned to one side, or rather vertically.

P. gibbosum. Gouty Stork's-bill. Willd. n. 105. (*Geranium gibbosum*; Linn. Sp. Pl. 946. Cavan. Diff. 265. t. 109. f. 1. *G. africanum*, foliis aquilegiæ; Riv. Pentap. Irr. t. 100.)—Umbels many-flowered. Leaves ternate, smooth; leaflets obtuse, notched; the middle one largest, three-cleft. Nectary cylindrical. Stem with knotty joints.—This also was very early brought from the Cape into the gardens of Europe. Yet its succulent *stem* renders it not one of the easiest to cultivate. The glaucous smooth *leaves* are well compared by Rivinus, whose plate is excellent, to those of the Columbine. The *calyx*, and partial *flower-stalks*, are finely downy, and rather hairy. Nectary nearly as long as the *stalk*, its termination not defined, except by the increasing downiness below it. *Flowers* of a dull yellowish or tawny green, exquisitely fragrant at night, like those of *triste*, &c.

P. exilipulatum. Soft-leaved Trifid Stork's-bill. Willd. n. 106. L'Herit. Geran. t. 35. (*Geranium exilipulatum*; Cavan. Diff. 253. 271. t. 123. f. 1.)—Umbels of few flowers. Leaves heart-shaped, hoary, in three deep, lobed, toothed segments. Stipulas scarcely any.—Sent from the Cape of Good Hope in 1779, by Lieut. Col. William Paterson, at that time engaged there in a botanical expedition. This species bears a considerable resemblance to *crispum*, *adulterinum*, &c. in general habit. The *leaves* are small, fragrant, on longish stalks. Stipulas hardly to be seen but on the youngest most luxuriant *branches*, where they are awl-shaped and minute. *Flowers* from three to five on each stalk, rose-coloured, with spots on the two upper *petals*, rather small. Nectary twice the length of the *calyx*.

P. ternatum. Ternate Stork's-bill. Willd. n. 107. Curt. Mag. t. 413. Jacq. Ic. Rar. t. 544. (*Geranium ternatum*; Linn. Suppl. 306. Cavan. Diff. 255. t. 107. f. 2.)—Stalks with few flowers. Leaves ternate, rough, rigid; leaflets linear-wedge-shaped, three-cleft, toothed. Stem rough. Anthers five.—Of the same tribe with the last, but the herbage is rough and harsh to the touch; *flowers* larger and handfomer; *stipulas* ovate, pointed. It came to England in 1790.

P. fragile. Brittle-stalked Yellow Stork's-bill. Willd. n. 109. (*Geranium fragile*; Andr. Repof. t. 37.)—Umbels many-flowered. Leaves ternate, smooth, fleshy; leaflets wedge-shaped, cut; the middle one largest and three-cleft. Nectary as long as the flower-stalk.—Procured from the Cape by Messrs. Lee and Kennedy in 1792. A tender, succulent species, with buff or yellowish *petals*, striped with crimson. In these particulars it differs from the rest of those which close this section in Willdenow, though it agrees with them in the form and division of their *leaves*.

Section 7. *Stem shrubby. Leaves either pinnatifid or pinnate.* Four species.

P. carnosum. Fleshy-stalked White Stork's-bill. Willd. n. 111. (*Geranium carnosum*; Linn. Sp. Pl. 946. Cavan. Diff. 266. t. 99. f. 1. *G. africanum carnosum*, petalis angustis albicanibus; Dill. Eith. 153. t. 127.)—Umbels many-flowered. Leaves sinuated, pinnatifid; segments oblong, obtuse, cut and toothed at the extremity. Petals linear. Stem thick and fleshy.—This appears to have been

cultivated in Chelsea garden, so early as 1724. It is now not frequently to be met with. The *stem* is tall, erect, thick and juicy below; much branched and finely hoary above, terminating in numerous small *umbels*, of inconspicuous white *flowers*. The *nectary* is almost twice the length of the *calyx*, and above half as long as the *flower-stalk*, its base tumid, somewhat like that of *fulgidum*. The *style* is much elongated beyond the hairy rudiment of the beak.

P. ferulaceum, Willd. n. 112. Burm. Afr. t. 36. f. 1, we have not seen, but it has the appearance of a narrow-leaved variety of the last. With *P. alternans*, Willd. n. 113, we are also unacquainted. It occurs in the Hortus Cantabrigiæ of the late Mr. Donn.

P. ceratophyllum. Horn-leaved White Stork's-bill. Willd. n. 114. L'Herit. Geran. t. 13. Curt. Mag. t. 315.—Umbels many-flowered. Leaves distantly pinnatifid, fleshy, rather cylindrical; segments channelled, three-cleft or pinnatifid.—Native of the fourth-west coast of Africa, from whence it was sent to Kew in 1786, by Mr. A. Hove. Like all the fleshy kinds, it is best preserved in a stove. Its habit and *flowers* much resemble the *carnosum*, but the *nectary* is only as long as the *calyx*. The *leaves* are smooth, glaucous, peculiarly thick and fleshy, with almost cylindrical segments, that are generally simple, and but slightly toothed towards their extremities; but we have a specimen in which they are deeply pinnatifid, so that this species connects the present section with the following, being indeed nearly akin to *crithmifolium*.

Section 8. *Stem shrubby. Leaves twice or thrice compounded.* Six species.

P. crithmifolium. Samphire-leaved White Stork's-bill. Willd. n. 115. Smith Ic. Pict. t. 13. (*P. paniculatum*; Jacq. Hort. Schonbr. v. 2. 6. t. 137.)—Umbels many-flowered, panicled. Leaves doubly pinnate, fleshy; segments dilated and cut. Petals obtuse; the upper ones crisped at the base.—Seeds of this noble species were brought from the Cape of Good Hope by the celebrated captain Riou of the Guardian, and being raised in the stove of the marchioness of Rockingham, the plants flowered in April 1792. It greatly exceeds the last in size, and has more compound and dilated *leaves*. The *stem* is very fleshy, resembling a cabbage-stalk, leafy below, crowned at the summit with an ample *panicle*, composed of numerous *umbels* of white *flowers*, which resemble those of *carnosum* and *ceratophyllum*; but the *petals*, instead of being oblong and acute, are obovate and obtuse, the two uppermost bluish-coloured, and remarkably crisped on each side at the base. We have therefore no doubt of the species being perfectly distinct.

P. abrotanifolium. Southernwood-leaved Stork's-bill. Willd. n. 117. Jacq. Hort. Schonbr. v. 2. 6. t. 136. (*Geranium abrotanifolium*; Linn. Suppl. 304. Cavan. Diff. 256. t. 117. f. 1.)—Umbels of few flowers. Leaves in many cylindrical, channelled, compound, hoary segments. Nectary as long as the flower-stalk. Calyx very hairy.—Gathered by Thunberg at the Cape. We have not heard of it amongst our collectors. The *stem* is woody, bushy, much branched, not fleshy. *Leaves* like those of *Artemisia Abrotanum*, numerous, crowded, somewhat aromatic, even when they have been many years dried. *Umbels* on longish stalks, each of about three light-purple, striped, smallish *flowers*, whose *calyx* is clothed with long horizontal hairs.

P. fruticosum. Willd. n. 118. (*Geranium fruticosum*; Cavan. Diff. 263. t. 122. f. 2.) appears to be a smooth-leaved variety of the foregoing. The name is not one of the most discriminative.

P. tenuifolium.

PELARGONIUM.

P. tenuifolium. Fine-leaved Pink Stork's-bill. Willd. n. 120. L'Herit. Geran. t. 12. (*P. hirtum*; Jacq. Ic. Rar. t. 536. Willd. n. 119. *Geranium hirtum*; Burm. Geran. 48. n. 64. t. 1, excluding the reference to Linnæus. Cavan. Diff. 258. t. 117. f. 2.)—Umbels many-flowered. Leaves oblong, pinnate, thrice compound, hairy, with linear segments. Stem fleshy. Nectary the length of the calyx.—Native of the Cape. Introduced into England by Mr. W. Malcolm, in 1768. We do not hesitate to unite, in this place, two supposed species of Willdenow; and it is fortunate that his and Burmann's name of *hirtum* here becomes superfluous, that very fine appellation having been inadvertently applied by Willdenow to his own ninth species, the *filosum* of Cavan. Diff. 273. t. 199. While we thus, as in other instances, attempt to correct the imperfections of our laborious predecessor, we cannot withhold our testimony to the merit of his performance, concerning the present genus. His arrangement of the species is the best we have met with, and he appears to have practically studied and understood most of them; having been misled now and then, chiefly by a deference to other writers. We hope to find this beautiful and favourite family of plants still further illustrated and enriched, in the fourth volume of the second edition of Mr. Aiton's Hortus Kewensis, of which Willdenow's labours will, in this instance, with advantage, lay the foundation. S.

PELARGONIUM, in *Gardening*, contains plants of the fine-shrubby, under-shrubby, evergreen, and herbaceous perennial kinds, for the green-house, of which the species cultivated are; the lady's-mantle-leaved crane's-bill (*P. alchemilloides*); the sweet scented crane's bill (*P. odoratissimum*); the gooseberry-leaved crane's-bill (*P. grossularioides*); the coriander-leaved crane's-bill (*P. coriandrifolium*); the fleshy-stalked crane's-bill (*P. carnosum*); the horn-leaved crane's-bill (*P. ceratophyllum*); the gouty crane's-bill (*P. gibbosum*); the multifid-leaved crane's-bill (*P. radula*); the butterfly crane's-bill (*P. papilionaceum*); the scarlet-flowered crane's-bill (*P. inquinans*); the common horse-shoe crane's-bill (*P. zonale*); the two-coloured crane's-bill (*P. bicolor*); the balm-scented crane's bill (*P. vitifolium*); the rose-scented crane's-bill (*P. capitatum*); the clammy crane's-bill (*P. glutinosum*); the hooded crane's-bill (*P. cucullatum*); the heart-leaved crane's-bill (*P. cordatum*); the prickly-stalked crane's-bill (*P. echinatum*); the square-stalked crane's-bill (*P. tetragonum*); the birch-leaved crane's-bill (*P. betulinum*); the spear-leaved crane's-bill (*P. glaucum*); the sorrel crane's-bill (*P. acetosum*); the rough-leaved crane's-bill (*P. scabrum*); the ternate crane's-bill (*P. ternatum*); and the three-coloured crane's-bill (*P. tricolor*).

The first has a variety with a dark circle in the middle of the leaves.

In the eighth sort there are two varieties, a larger and a smaller; and as it is readily raised from seeds, it affords many femal varieties.

The eleventh sort contains a variety with fine variegated leaves, and the flowers vary much in colour from purple, through the different shades of red to high scarlet.

In the fifteenth, several varieties have been produced from seed.

In the seventeenth there are several varieties.

The eighteenth also varies with petals of a rich purple colour, in which the spots are similar, but not so conspicuous.

In the nineteenth there is a variety with beautifully coloured leaves.

And in the twentieth there is a variety with scarlet flowers raised from seed.

Method of Culture.—All the sorts may be increased by seeds, which should be sown in the early spring in pots filled with kitchen-garden mould, plunging them in a moderate hot-bed. The plants soon appear; when they should have fresh air as much as possible, to prevent their being drawn up weak. When the plants have attained some growth, they should be removed into separate small pots filled with the same sort of earth, replanting them in the hot-bed till fresh rooted, and giving proper shade. They should afterwards be gradually inured to the open air, in order to be placed out in it, in the summer season, in a sheltered situation.

They may also be raised in the open ground without the hot-bed, but not so well.

But they are more commonly increased, especially the shrubby sorts, by cuttings of the young branches, which should be planted in a shady border in the summer, or in pots, and plunged in any hot-bed; which is the better method. When well rooted they may be taken up, and planted into separate pots, placing them in the shade till they have taken new root; after which they may be removed into a sheltered situation, and be treated in the same manner as the seedling plants. The fifth, seventh, and fifteenth sorts have more succulent stalks than the others; the cuttings should therefore be planted in pots filled with the same sort of earth, and plunged into a very moderate hot-bed, where they may be shaded from the sun in the heat of the day; and have but little water; for these are very apt to rot with much moisture. When these are well rooted, they may be removed, and planted in separate pots filled with the same sort of earth, and placed in the shade till they have taken new root; then they may be removed into a sheltered situation, where they may remain till autumn. These sorts should be sparingly watered, especially in the winter season, as they are apt to take a mouldiness with moisture, or in a damp air. They thrive much better in an airy glass-case than in a green-house, as in the former they have more sun and air than in the latter. But all the other shrubby sorts are proper for the green-house, where they only require protection from frost, but should have a large share of free air when the weather is mild. They require water every week, in mild weather once or twice; but it should not be given them in too great plenty, especially in frosty weather. These plants should be hardened in the spring gradually, and towards the middle or end of May be taken out of the green-house, and at first placed under the shelter of trees, where they may remain a fortnight or three weeks to harden; and then be removed into a situation where they may be defended from strong winds, and enjoy the morning sun till eleven o'clock, where they will thrive better than in a warmer situation. And as these sorts grow pretty fast, they soon fill the pots with their roots; and when they stand long unremoved in summer, they frequently put out their roots through the holes at the bottom of the pots into the ground, when the plants grow vigorously; but if suffered to continue long in this manner, it is difficult to remove them; as if their roots be torn off, all the younger branches decay, and the plants are frequently killed. The pots should therefore be moved once in a fortnight or three weeks, in the summer months, and the roots which may then be pushing through the holes cut off, to prevent their striking into the ground.

They require also to be new potted at least twice in the summer; the first time after they have been three weeks or a month out of the green-house; the second towards the end of August, or beginning of September, that the plants may have time to establish their new roots before they are removed into the green-house. When this is performed, all the roots on the outside of the balls of earth should be carefully

fully pared off, and as much of the old earth drawn away from the roots, as can be done with safety to the plants; then, where they require it, they should be put into pots a size larger than those out of which they were taken, putting a quantity of fresh earth into the bottom of each pot, placing the plants upon it, being careful that the ball about the roots of the plant be not so high as the rim of the pot, that some room may be left to contain the water which may be given to them. Then the cavity all round the ball should be filled up with fresh earth, be gently pressed down, and the bottom of the pot beaten upon the ground, to settle the earth; the plant being then well watered, and the stem fastened so as to prevent the wind from displacing the roots before they are fixed in the new earth.

Where such mould as has been mentioned cannot be procured, fresh hazel loam from a pasture, mixed with a fourth or a fifth part of rotten dung; or, where the earth is inclinable to bind, a mixture of rotten tan; and, where light and warm, a mixture of neat's-dung may be employed. This compost should be mixed three or four months before it is used, and be turned over three or four times, that the parts may be well incorporated.

The shrubby forts require to be looked over frequently during the winter, while they are in the green-house, to pick off all decayed leaves from them, which if left on will not only render the plants unhealthy, but by their falling off make a litter among the other plants; and if they are suffered to rot in the house, they occasion a foul, nasty, damp air, which is very prejudicial to all the plants.

The first fort, from having herbaceous stalks, is best increased by seeds, though cuttings of it will take root.

And the second fort may not only be propagated by seeds, but also from heads slipped off from the short fleshy stalk; which should have their lower leaves stripped off, and be then planted single in a small pot; or where the heads are small, two or three may be put into one pot; plunging them into a very moderate hot-bed, shading and refreshing them gently with water. They take root in a month or five weeks; when they should be hardened gradually to the open air, where they may remain till autumn, when they must be removed into shelter, as in the other kinds.

The sixth kind is capable of being increased both by seeds and cuttings, but it is found to be more tender than many other forts, and more liable to be injured by damps. The eighth species is readily increased by cuttings; but the twelfth is more difficultly to be raised in this way. The fifteenth is easily raised by cuttings, and sometimes by seeds; and the seventeenth readily strikes from cuttings; the eighteenth produces seeds, but is more usually increased by cuttings; and the nineteenth and twentieth are readily propagated in the same way; the twenty-first is likewise raised from cuttings, but they are not very free in striking; the twenty-fourth is raised in this manner without difficulty; but in the twenty-fifth, from the branches running out speedily into flowering stalks, few are formed proper for cuttings, and these are struck with difficulty.

All these plants are highly ornamental, and afford considerable variety in collections of green-house plants.

PELASGIANS, in *Ancient Geography*, the most ancient people of Greece, according to Thucydides, Strabo, and Herodotus. The last author says, that the whole country, which in his time was called "Hellas," was in a former period denominated Pelasgia. These people, as some say, were denominated Pelasgi, because they were an unsettled wandering people, who often changed their habitations. Others, among whom we may reckon Hesiod, take them to have been Autochthones, which was the designation given

to the natives of the country, or rather to all whose original was unknown. If we admit Apollodorus's authority, in which Servius (on the 2d *Æneid*) acquiesces, the Pelasgi derived their name from one Pelasgus, a person of great antiquity, and several persons of this name are mentioned by ancient writers. The ancient Scholiast on Apollodorus Rhodius, makes Pelasgus to have been the son of Inachus, and this is the same who, according to Hesiod, was the father of Lycaon, king of Arcadia. According to Pausanias (in *Arcad.*) Pelasgus was the first man who appeared in the country, and surpassed all others in the faculties both of his body and mind. As soon as he began to reign, he taught the Arcadians to erect cottages to shelter themselves from the injuries of the weather, and to clothe themselves with bear's skins. Till that time they had lived upon leaves of trees, herbs, and roots; but instead of these he recommended the use of acorns, or rather a kind of fruit which grew upon the beech-tree; and this food became so common, that long after Pelasgus, the Arcadians were represented as a people who lived only upon acorns, and who on this account were terrible and invincible in war. See *GRÆCIA*.

The writers first cited in this article say, that the Pelasgians were first known in Thessaly, and that from thence they extended their migrations through all the other countries of Greece. However, Dionysius of Halicarnassus says, that they derived their origin from Peloponnesus, and that they sent from hence colonies into Thessaly. This author adds, that these people left Thessaly, and spread themselves through Epirus, Italy, Thrace, the isles of Asia Minor, under the reign of Deucalion. M. de Gebelin says, that the Pelasgi were the possessors of the whole country, which extended from the banks of the Danube to the sea of Peloponnesus; that some of them peopled Thrace, Getia, Macedonia, Illyria, Epirus, Thessaly, the Phocids, the Peloponnesus, and Attica; and that others crossed the Danube, and bore the appellation of Dacii and Getæ. They are said to have replenished all these countries with celebrated cities, and an immense population; to have extended cultivation wherever they went, and to have sent out numerous colonies. On account of these emigrations they were reckoned a wandering people, without arts and sciences.

If we may credit Herodotus, the Pelasgi, having settled in Samothracia, introduced thither the worship of the Cabiri and their mysteries, which they afterwards communicated to the Athenians, among whom they fixed their residence when they quitted that island; but he does not inform us from whom they derived their knowledge of these gods and of their mysteries. We learn from Dionysius Halicarnassensis that some of the Pelasgi, who departed from Thessaly, were received at Dodona; and that in obedience to an oracle they passed into Italy, and settled at the mouth of the Po. Those of them that were least able to bear fatigue, were entrusted with the care of their vessels, and others of them advanced into the country, traversed the mountains, and descended into the country of the Umbrians. Among these people, they obtained some cities, till they were forced to retire among the aborigines, who were the neighbours of the Arcadians; and in process of time they conciliated the aborigines, and were allowed to settle among them. But the country being too small for their accommodation, the Pelasgi induced the aborigines to join them in making an irruption into Umbria, where they took possession of Crotona. Here they founded other cities, which were afterwards occupied by the Tyrrhenians. The Pelasgi founded the town of Larissa, in Campania, of which country they possessed a part after having expelled from it the Aurunci.

In Italy the Pelasgi, after the departure of the Siculi, enjoyed

enjoyed a large and beautiful territory, so that they became rich and powerful. Those who had been left to guard their vessels, built a town to which they gave the name of the river, and gradually became masters of the sea. They sent to the temple at Delphos tithes of their marine profits; at length, however, they were attacked by their neighbours and obliged to abandon their city. The Pelasgi, who were associated with the aborigines, were overpowered by their barbarian neighbours, so that only a few remained among the aborigines, the greatest part having been dispersed in Greece, and among the Barbarians. According to Dionysius Halicarnassensis it was about two generations before the war of Troy, that the Pelasgi experienced these misfortunes. All the towns which they inhabited were demolished, excepting Crotona; but it changed its name and its inhabitants, and in the time of this historian was called Cothornia.

According to the relation of Herodotus, the Pelasgi, under the reign of Deucalion, were in possession of the part of Thessaly called Phthiotis, where they remained till the reign of Dorus, grandson of Deucalion. They then migrated to another part of Thessaly called Esfizotis, situated at the foot of mount Ossa and mount Olympus. From thence they were driven by the Cadmæans, and they established themselves at the foot of Pindus, and were denominated Macedonians.

Dionysius of Halicarnassus says, that about two generations before the war of Troy, some of the Pelasgi, driven from their cities, returned into Greece. These settled in Attica, the Athenians assigning to them a territory at the foot of mount Hymettus, on condition of their building a wall to encompass the citadel. Their ingenuity excited the jealousy of the Athenians, and they expelled them from Attica. They then dispersed in different places, and one party settled in the isle of Lemnos. When they were established in this island they determined to avenge themselves on the Athenians; and for this purpose armed their vessels and made a descent on Attica. Here they seized a number of females, who were celebrating the feast of Diana, and taking them to Lemnos, made them their concubines. The offspring of these females being instructed in the language of the Athenians, and in their mode of life, conceived an aversion to the legitimate children of the Pelasgi; and this occasioned the murder of the illegitimate children and of their mothers. The Athenians, under the command of Miltiades, drove the Pelasgi from Lemnos; and they then established themselves, according to Herodotus, in the town of Aclé, a territory separated from the continent of Thrace by a canal; by degrees they extended themselves to the continent, and occupied Crestonia.

Dionysius informs us, that when some of the Pelasgi, under the reign of Deucalion, passed into Italy, the isle of Crete, and the Cyclades, Bœotia, the Phocide, and Eubœa, others migrated into Asia. According to Strabo, the Lesbians claim the honour in behalf of their ancestors of having been in the war of Troy, under the conduct of Pylæus, a chief of the Pelasgi. All the towns of the maritime coast of Ionia had been at one time inhabited by the Pelasgi; the inhabitants of the isle of Chios also pretend that the Pelasgi of Thessaly were their founders; nor indeed is there a country of Greece, Thrace, and Asia Minor, in which the Pelasgi have not left traces of their power. Soon after the war of Troy, the name of Pelasgi began to sink into oblivion. Those who existed till the time of Herodotus, near the Hellespont, and on the coasts of Thrace, were subject to foreign dominion; and the language which they spoke was the only evidence of their ancient origin. Thucydides says, that the chief cause of the ruin of this nation was the confederation of

the Hellenes, who sprang from the Pelasgi themselves. The Hellenes made a league, formed among themselves a separate body, and made conquests. After separation from the Pelasgi, their parents, they estranged themselves from their names and habits, and by little and little changed their language, in consequence of the commercial intercourse which they had with colonies from the east. Those at length who were originally Pelasgi joined this league, surrendered the name of Pelasgi, and adopted that of Hellenes. Herodian relates, that the Athenians, though reckoned to be Pelasgians at the time of the famous emigration of these people, were become Hellenes, when the Pelasgi, driven from Italy, returned to Greece. About the same time the Lacedæmonians, the Argians, and the Arcadians, who had been also known under the name of Pelasgians, laid aside the barbarism of their progenitors, and assumed the name of Hellenes. The Pelasgi, according to Herodotus, established at Dodona the most ancient and the most respectable of the oracles of Greece. He adds, that they had no other idols nor temples; that they offered their sacrifices to the gods, and gave neither name nor surname to the deities whom they worshipped.

Dionysius Halicarnassensis, in speaking of the antiquity of the Pelasgians, inhabitants of Falerii and Fescennia, two ancient cities of Etruria, built in the Grecian form, says, "the manner of their religious ceremonies was the same as those of Argos. Holy women served in the temple, and a girl unmarried, called canephoros, or basket-bearer, began the sacrifice, besides chorusses of virgins, who hymned the goddess in songs of their country." Now as the Romans had an earlier communication with the Etruscans than with the Greeks, this passage renders it very probable that they were obliged to the people of Etruria for their religious ceremonies, and for vocal music.

Strabo, (de bello Punico,) says in express terms, that the public music, especially such as was used in sacrifices, came from Etruria to the Romans. See also Livy, lib. xxxix.

PELASGICUS SINUS, a gulf of Thessaly, on the coast of the Phthiotide. This gulf had Magnesia on the east, and the Phthiotide on the west; its entrance was a wide strait, between the town of Antron to the south, and the promontory Æantium to the west.

PELASGIOTIS, or PELASGIS, a country of Thessaly, the extent of which is variously assigned by different authors. The epoch of the arrival of the Pelasgi in Thessaly is fixed by some writers to the year 1883 B.C. It is probable, that they established themselves in the centre of the country, to the S. and N. of the Alpheus; but some say that this province had for its boundaries to the N. Aliacmon and the Peneus to the S. But if the Pelasgiotide be considered as comprehending three parts, viz. Perrhæbia, Pelasgiotide proper, and the delightful valley of Tempe, the country must have extended to the S. of the Alpheus. From W. to E. its extent was limited by the mountains.

PELATÆ, Πελαταί, in *Antiquity*, a particular kind of servants among the Athenians.

The pelatæ were free-born citizens, who by reason of their indigence, were forced to serve for wages. They had no suffrage in public affairs, as not being masters of an estate proper to qualify them for giving their votes; but this restriction was not perpetual. They were otherwise called *thetes*, and continued in the condition of servants only during their own pleasure and necessities; for they had power either to change their masters, or (if they became able to subsist themselves) wholly to release themselves from servitude.

PELCHILLEN, in *Geography*, a town of Prussia, in Natangen; 25 miles S.S.E. of Königberg.

PELECANUS.

PELECANUS, *the Pelican*, in *Ornithology*, a genus of birds of the order *Anseres*. The generic character is, bill straight, hooked at the point, and furnished with a nail; the nostrils have an obliterated slit; the face is rather naked; the legs balance the body equally; the four toes are connected by a membrane.

The birds of this genus are gregarious, fond of fish, and in general remarkable for their extreme voracity. For the most part they keep out at sea, but some of them are found in the interior parts of continents. They have a long bill, in a lateral furrow of which lie the nostrils. Several of the tribe are rendered useful to mankind, by being taught to fish for them. There are thirty-one species, divided into sections according to the structure of the bill.

A. *Bill without Teeth.*

Species.

ONOCROTALUS, or *White Pelican*. The birds of this species are, as the name imports, white; the gullet is pouched; the bill is red, and from fifteen to sixteen inches long; the upper mandible is depressed and broad, the lower forked; bag at the throat flaccid, membranaceous, capable of great distension; the irides hazel-coloured; the gape of the mouth wide; the head is naked at the sides, covered with a flesh-coloured skin; the hind head is somewhat crested; the body is faintly tinged with flesh-colour; the spurious wings and first quill-feathers are black; the legs are of a lead colour. It is larger than a swan, and about five feet long. It inhabits Asia, Africa, and South America. In fishing, this bird does not immediately swallow its prey, but fills its bag, and returns to the shore to devour at its leisure the fruits of its industry. As it has a very quick digestion, it has generally to fish more than once in a day. At night it retires to rest, a little way on the shore, with its head resting on its breast. In this state it remains almost motionless, till hunger calls it to break its repose. It then flies from its resting-place, and raising itself 30 or 40 feet above the surface of the sea, turns its head with one eye downwards, and continues to fly in that posture till it sees a fish sufficiently near the surface, when it darts down with astonishing swiftness, seizes it with unerring certainty, and stores it up in its pouch. It then rises again, and continues the same manœuvres, till it has procured a competent stock. The female feeds her young with fish, macerated a long time in her bag. The pelican is susceptible of domestication, and may be trained to fish for its master. The pelican generally builds in marshy and uncultivated places, particularly in islands and lakes, making its nest, which is deep, a foot and a half in diameter, of carices, and lining it with grass of a softer texture. It lays two or more white eggs, which, when harassed, it sometimes hides in the water. When it builds in dry and desert places, it brings water to its young. It walks slowly, flies in flocks, and lives in society with other birds.

ROSEUS; *Rose-coloured Pelican*. This species is of a rosy colour; the gullet is pouched; the bill and legs are black; the area of the eyes is naked; the pouch yellow. It is about the size of a goose, and inhabits Manilla.

FUSCUS; *Brown Pelican*. This, as its name imports, is cinereous brown; the gullet is pouched. It inhabits America, and is four feet long.

MANILLENSIS; *Manilla Pelican*. Entirely brown; gullet pouched. It inhabits, as its name shews, Manilla, and is very like the roseus.

PHILIPPENSIS; *Philippine Pelican*. White; crest varied with white and brown; the gullet is pouched. It is about

four feet and a half long, and is found in the Philippine islands.

RUFESCENS; *Red-backed Pelican*. Reddish; crested head and neck reddish-white; tail dusky; the gullet is pouched. It is four feet long, and inhabits Africa.

CAROLINENSIS; *Charlestown Pelican*. Dusky above, beneath white; gullet pouched. There are two other varieties: 1. One is reddish-white beneath; the upper mandible is rounded at the base. 2. The other is on the lower part of the back striate and dusky-white. It inhabits America; is above three feet long; the pouch is very large.

ERYTHORHYNCHOS; *Rough-billed Pelican*. Crested; white; gullet pouched, and streaked with black. It inhabits North America, and is four feet and a half long.

AQUILUS, or *Frigate Pelican*. The tail is forked; body ferruginous, and orbits black; the bill is red; belly of the female white. It is three feet long; and the extent of the wings is full fourteen feet. It inhabits within the tropics. It is mentioned by Dampier, and other navigators, as the frigate bird. From its great expanse of wing it is capable of flying very smoothly, and so high as to be scarcely visible, seldom coming to land. It feeds on fishes, particularly flying fish, on which it darts with the greatest velocity. It builds on trees or on rocks, and lays one or two eggs of a flesh-colour, and spotted with red.

MINOR; *Lesser Frigate Pelican*. The tail is forked; body ferruginous; bill and orbits red. It resembles the last, but is less, being only about three feet long.

LEUCOCEPHALUS; *White-headed Pelican*. The tail of this species is forked; the body brown; head, neck, breast, and belly white; bill dusky.

PALMERSTONI; *Palmerston Frigate Pelican*. Tail forked; body glossy green-brown, beneath white; throat varied with black. It inhabits Palmerston's island in the South Pacific ocean; is about three feet two inches long. The bill is black; the temples feathered; the legs blackish.

*** CARBO**; *Corvorant*. Tail rounded; body black; head somewhat crested; bill blackish; the base of the lower mandible covered with a yellowish skin, extending under the chin, and forming a pouch; irides green; chin white, surrounded with a yellowish arch; tail long and lax, consisting of fourteen feathers; thighs with a white spot, dotted with black; legs black. Three feet long; size of a goose, but more slender, and weighs about seven pounds. Inhabits Europe, Asia, and America. Common on many of our sea-coasts, building its nest on the highest parts of cliffs that hang over the sea, and laying three or more pale green eggs, about the size of those of a goose. In winter these birds disperse along the shores, and visit the fresh waters, where they commit great depredations among the fish. They are remarkably voracious, and have a very quick digestion. Though naturally extremely shy and wary, they are stupid, and easily taken when glutted with food. Their smell, when alive, is more rank and offensive than that of any other bird; and their flesh is so disgusting, that even the Greenlanders will hardly taste it. It is not uncommon to see twenty of these birds together, on the rocks of the sea-coast, with extended wings, drying themselves in the wind. In this attitude they sometimes remain for nearly an hour, without once closing their wings; and as soon as the latter are sufficiently dry to enable the feathers to imbibe the oil, they press this liquor from the receptacle on their rumps, and dress the feathers with it. It is only in one particular state that the oily matter can be spread on them, namely, when they are somewhat damp; and the instinct of the birds teaches them the proper moment. Corvorants were formerly sometimes trained in this country, as they still are in China, for the purpose

PELECANUS.

purpose of catching fish for the table. With this view they were kept with great care in the house, and when taken out for fishing, they had a leathern thong tied round their neck, to prevent them from swallowing their prey.

GRACULUS; Shag. Tail rounded; body black, brown beneath; tail-feathers twelve; head and neck black, with a green gloss; back and wing-coverts purple-black, glossy at the edges; middle of the belly dusky; legs black. Weighs about four pounds. Length twenty-nine inches. The female weighs about three pounds and a quarter, and is only twenty-seven inches long. Inhabits the northern seas of Europe. Swims with its head erect, and the body under water. On perceiving the flash of a gun, dives instantaneously, and rises at a considerable distance. Has the manners and habits of the preceding, and devours a prodigious quantity of fish. There are two other varieties of this species: in the first the chin is yellow, and the tail wedged. It is found in the Cape of Good Hope. The second is blackish, but beneath it is brown; the feathers above are edged with black. It inhabits Cayenne, and the Caribbee islands, and is about twenty-six inches long.

PYGMÆUS; Dwarf Shag. The tail is wedged, the feathers twelve in number; the body is black, with a few scattered white spots. It inhabits the Caspian sea, and is about the size of the garganey, a species of the *Anas* genus. The female is brown, without spots. A variety has its chin of a mouse colour, and its legs black.

PUNCTATUS; Spotted Shag. Crested; black; tail rounded; wings dark ash, spotted with black; sides of the neck with a white line. It inhabits New Zealand, and is nearly two feet long.

* **CRISTATUS**; Crested Shag. This is found in many parts of the north of Europe, and in our own country. It is of a shining green, beneath it is dusky; bill and legs dusky; head crested; the bill is blackish; irides green; feathers each side the head long, forming a crest; the tail-feathers twelve in number, and of a dusky green; the head often not crested.

VIOLACEUS; Violet Shag. Crest erect; body shining violet-black. It inhabits Kamtschatka, and the neighbouring islands.

URIEL; Red-faced Shag. Shining green; throat and orbits white; face naked, blueish-red; wings and tail dusky; legs black. It inhabits Kamtschatka, and is about thirty-four inches long.

CARUNCULATUS; Carunculated Shag. Black, beneath white; face naked, carunculate, red; orbits elevated, blue; wings with a white band. It inhabits New Zealand, and is about twenty inches long.

MAGELLANICUS; Magellanic Shag. Black, beneath white; temples and chin naked, reddish; head turned, temples with a white line; tail wedged. It inhabits Terra del Fuego and Staten land islands, at the extremity of South America. It is about thirty inches long.

VARIUS; Pied Shag. Brown, beneath white; rump, wings, and rounded tail black; eye-brows pale; area of the eyes naked, yellow. It inhabits New Zealand; two feet and a half long; it builds in trees; the eggs are of a pale greenish-white.

CIRRATUS; Tufted Shag. Black, beneath white; crown crested; wings with a white band; tail rounded; bills and legs yellow. It inhabits New Zealand, and is thirty-four inches long. The orbits are naked; the crest turned back; tail-feathers fourteen; bill and legs yellow.

AFRICANUS; African Shag. Brown-black, beneath varied with white and blackish; chin white; wing-coverts

blue-grey, edged and tipped with black. It is found in Africa and is about twenty inches in length.

B. *Bill ferrate.*

Species.

THIAGUS; Saw-billed Pelican. Brown; tail rounded; gullet pouched, and covered with short cinereous feathers. It inhabits Chili; is the size of a turkey; extends its wings about nine feet. The bill of this species is about a foot long, each mandible is hooked; the pouch is very long, and the legs black.

* **BASSANUS**; Gannet or Soland Goose. Tail wedged; body white; bill and quill-feathers black; face blue; irides yellowish; tail-feathers twelve; eyes surrounded with a naked skin of fine blue; legs black, and greenish on the fore part; the feet long. Weighs seven pounds, and inhabits Europe and America. This species of pelican haunts the Bass island in the frith of Edinburgh, Ailsa on the coast of Ayrshire, the island of St. Kilda, and hardly any where else in Europe. It arrives at these spots in March, and continues till September. As it must let itself fall before it takes wing, it requires a steep and precipitous breeding station. It makes a rude nest of sticks, grass, sea-plants, and lays one egg. While the female is occupied with incubation, the male brings her food, which consists almost entirely of herrings and sprats. In the bag under their bill they are able to fetch four or five herrings at a time, and a great number of sprats, which the young bird extracts from the mouth of the old one with its bill, as with pincers. The young begin to be taken in August, and by some are relished as an exquisite morsel; but the old ones are tough and rancid. The fowler, who seizes the young, is let down by a rope from the top of a cliff, and is sometimes stationed on the slippery projection of a rock, with the perpendicular precipice of four hundred feet or more beneath him. The young are of a dark grey colour, and continue so for a year or more, when they gradually become white, except the tips of their wings, which are always black. In September and October the old birds leave their breeding places, and migrate southward, following, as is alleged, the shoals of herrings. In December they are often seen off Lisbon, plunging for sardinæ; but after that period, it is not well known what becomes of them till March. They are common on the coasts of Norway and Iceland, and are said to be met with in great numbers about New Holland and New Zealand. They also breed on the coast of Newfoundland, and migrate southward along the American shores, as far as South Carolina. Of this species there are two varieties: the first is brown, spotted with white, and white beneath, with naked and blackish. The second is brown, with triangular white spots, whitish, and spotted with brown beneath; the bill, wings, tail, and legs brown.

PISCATOR, or Lesser Gannet. Tail wedged; body whitish; all the quill-feathers black; face red. It inhabits the Chinese, Indian, and American seas; and is about thirty inches long.

SULA; Booby. Tail wedged; body whitish; primary quill-feathers tipped with blackish; face red. It inhabits South America, and the neighbouring isles, and is about thirty inches long.

FIBER; Brown Booby. Tail wedged; body brownish; all the quill-feathers blackish; face red. It inhabits America and Africa, and is rather more than two feet in length.

SINENSIS; Fishing Corvorant. Tail rounded; body brown, whitish, and spotted with brown beneath; throat white; bill yellow; irides blue. It inhabits China, where

it is tamed for the purpose of catching fish. The bill of this bird is yellow, and the irides blue.

PARVUS; Lesser Booby. This species is black, beneath it is white; the face downy. It inhabits Cayenne, and is about eighteen inches long.

PELECANUS, a name given by some authors to the *platea*, or spoon-bill; a bird very different from the pelican, being of the stork or heron kind. See **PLATALEA**.

PELECHUCO, in *Geography*, a town of Peru, in the diocese of Cusco; 36 miles N.N.W. of Carabaya.

PELECINUS, in *Botany*, a kind of vetch, or leguminous plant, mentioned by Pliny, book 21. chap. 12. l. 45, as "growing in corn-fields, and having small shrubby stalks, with leaves like *Cicer*. It bears its seeds in pods (or legumes), which terminate in a hooked point, and grow three or four together, &c." This description accords well with the Linnæan *Coronilla Securidaca*, which is certainly the ἰνδοῦρον of Dioscorides; and Gesner, as well as Bauhin, rightly so understood it. Pliny says "the seeds are bitter, and good for the stomach." It is remarkable that the modern Greeks, at this day, know the plant by the name of πικροπόδι, or *bitter-pod*. The seeds of a very similar plant, *Trigonella Fanumgræcum*, always enter into the composition of curry-powders in Hindoostan, and are supposed to possess a stomachic quality. Such a near coincidence is frequent between the medical opinions of the most ancient nations.

This being the true *Pelecinus*, we cannot account for Tournefort's having adopted the word as the name of the Linnæan **BISERRULA**, see that article; to which it is certainly misapplied, nor does he give any reason or explanation concerning it. This, however, led Linnæus, as it seems, to retain it for the specific name of that curious plant.

PELECOID ANGLE, in *Geometry*. See **ANGLE**.

PELECOIDES, from πέλεκυς, *hatchet*, and εἶδος, *form*, a figure in form of a hatchet.

Such is the figure **BCDA**, (*Plate X. Geometry, fig. 16.*) contained under the inverted quadrantal arcs **AB** and **AD**, and the semicircle **BCD**.

The area of the pelecoides is demonstrated to be equal to the square **AC**; and that, again, to the rectangle **EB**. It is equal to the square **AC**, because it wants of the square on the left hand, the two segments **AB** and **AD**, which are equal to the two segments **BC** and **CD**, by which it exceeds on the right hand.

PELEE, in *Geography*, a small island in the English channel, near the coast of France; three miles N.E. of Cherbourg. N. lat. 49° 41'. W. long. 1° 28'.

PELEGRINI, VALERIO, in *Biography*, an eminent singer, who was in the service of Spain in 1700.

PELEGRINI, PIETRO, a native of Brescia, and some time organist of the Jesuits' church in that city. He was a very neat player on the harpsichord, and a lively composer for that instrument. Bremner published a book of lessons of his composition, and several books were published at Paris, where, in 1742, he set a drama to music, translated from Stampiglia, called *Cirene*.

We heard him perform at Calais in 1766, at a concert for his own benefit. He was then in years, and in the last stage of a consumption; but the Duc de Montpensier, then governor of Calais, coming into the room during the performance, the poor man was obliged to rise and finish his concerto standing. We saw with uneasiness the difficulty with which he supported himself, and executed difficult passages: but no performer was to sit in the presence of the ducal governor, any more than in that of any of the royal family.

PELEGRINI, FERDINANDO, a Neapolitan composer and performer on the harpsichord. According to M. Gerber, the

continuator of Walter's Musical Lexicon, he published a Paris and in London several works for the harpsichord. There is some mistake in the christian names of these two harpsichord-composers, and the works of one are indiscriminately ascribed to the other; nor are we certain of there having been two composers of the same time, of the same name, and in the same places, of similar professional abilities.

PELEGRINO, in *Geography, an island in the Pacific ocean, discovered by Quiros in 1606. S. lat. 14°. W. long. 162°.—Also, a mountain on the N. coast of the island of Sicily, near Palermo, in which is a celebrated sanctuary dedicated to St. Rosalia.*

PELENGON, or **GELENGON**, a town of Persia, in the province of Laristan; 66 miles N.E. of Lar.

PELES, a town of Sweden, in the province of Savolax; 48 miles E. of Nyflot.

PELEW ISLANDS, or **PALAOIS**, a group of islands in the western part of the Pacific ocean, or in that extensive division of the globe, called *Polynesia*, situated between the Philippine islands and the Caroline islands. The first discovery of these islands has been attributed to some Jesuits of the Philippines, viz. the fathers Duberon and Cortil, who left the Philippines for this purpose on the 14th of November, 1710. Before this time, it was only known, that the largest island, which is the most northerly, was called Panlog, and that the royal residence was in Falu or Pelew. After a voyage of fifteen days these fathers discovered land towards the north-east, and the two isles that were seen were called those of St. Andrew, as having been discovered on the day of that apostle. From some Pelewan, whom they accosted, they received information that the true name of these isles was Sonfrol: that Panlog was to the N.N.E. and Pulo to the S.S.E. Panlog was afterwards discovered about fifty leagues from Sonfrol, in lat. 7° 14'. This seems to be the island now called Babelthouap, and the largest of the group, the S. extremity of which in Arrowsmith's maps is about lat. 7° 25'. Father Cantova's letter, dated 1722, and contained in the collection, entitled "Lettres Edifiantes," gives a brief account of the Pelews, and very unjustly represents the natives as cannibals. By his account, the group called the Palaos, or Pelews, consisted of seven principal isles, situated from N. to S. Their names were Pelilieu, Coaengal, Tagaleten, Cogcal, Yalap, Mogulibee, and Nagarrol: the king was called Yaray, and resided in Yalap. The natives were described by the Jesuits as naked cannibals, who were regarded with horror by the people of the Carolines. It was not till the year 1783, that we were able to obtain a just account of these islands, and of their inhabitants. When captain Wilson, commander of the Antelope packet, in the service of the East India Company, was wrecked on Oroolung, one of these islands, he derived that information which was communicated on his return to Mr. Keate; and this ingenious writer, indulging perhaps in some degree the glow of his feelings and imagination, drew up that very pleasing and interesting account, which, from its first publication, has passed through several editions. The whole group is said to contain eighteen islands; but those which Mr. Keate mentions are Oroolung, Artingall, Pelelew, Emilligue, Emunga, Aramalorgoo, Artaguy, Caragaba, and Pethoull: but the names of all were not discovered: and it was but lately known that Pelew was only the name of the capital of the island called Cooroora; and the residence of the king. From Mr. Keate we learn that the natives of these islands, so far from being savage cannibals, were remarkably mild, hospitable, and humane. These islands are in general of a moderate height, and covered with wood; and encircled on the W. side by a reef of coral, from two to six leagues from the shore, and of

PELEW ISLANDS.

great length. Cooroora, the capital of which is Pelew, bears the marks of industry and good cultivation. All the islands which the English saw were covered with trees of various kinds, and some of them of large size, which appeared from their canoes, made of their trunks, and capable of carrying twenty-eight or thirty men. Among the trees in the forest, they observed the ebony, and also a tree which, when pierced with a gimblet, yielded a juice of the consistence of cream; a species of the machinal tree; a tree in size and its branches resembling the cherry-tree, and in its leaves the myrtle, and having, instead of bark, an outward coat of the thickness of a card, darker than the inside, though equally close in texture: the colour of the interior part being nearly that of mahogany, and so extremely hard, that few of the tools which the English had could work it without breaking their edges. Here were also the cabbage tree, and a tree whose fruit resembled an almond: the carambola, and the wild bread-fruit, called by the natives "riafnall." Yams and cocoa-nuts being the chief means of subsistence, are objects of particular attention. Of the beetle-nut, which abounds, the natives make great use: and their islands also afford plantains and bananas, Seville oranges, and lemons. They furnish some sugar canes, great abundance of the bamboo, and likewise the turmeric, used as a dye, and employed by the women for staining their skins. None of the islands which the English visited afforded any kind of grain, nor any sort of quadruped, except some rats which were found in the woods, and three or four meagre cats, found in the house, and which were probably drifted ashore from some wreck. Of birds, pigeons were the most numerous; and they had plenty of cocks and hens, undomesticated and running wild in the woods, of which they had made no use as articles of food till they were instructed by the English to eat them. Several birds of beautiful plumage were observed to fly about, and some of a small size, whose notes were very melodious, and particularly one, which used to sing every morning and evening, with a pipe as sweet as a flageolet. Of fish they had great variety.

These islands, when seen from the sea, exhibit high rugged land, covered with wood; the interior parts were in many places mountainous, but the vallies were extensive and beautiful, and presented many agreeable prospects. The soil was in general rich; the grass, as no cattle ate it down, grew high, and was burnt up with the heat of the sun. The English saw no river in these islands; their supplies of fresh water were derived from small streams and ponds, of which there were many. They had no salt, or any kind of seasoning with their food, which consisted chiefly of fish, and they had also a kind of sweet-meats, which they prepared from the sugar-cane, which seemed to be indigenous. The milk of the cocoa-nut was their usual beverage. As soon as they rise, which is commonly at day-light, they immediately go to bathe in fresh water. They had no method of measuring time, but by the height of the sun; and they divided their seasons, like the inhabitants of other tropical countries, into wet and dry. They appeared to have some knowledge of the stars, to several of which they gave names. Those islands that were visited by the English appeared to be populous, but the account of their population was not ascertained. Their houses were placed upon large stones, and raised about three feet from the ground; being constructed of planks and bamboos, and having the fire-place in the middle, secured with hard rubbish. For public meetings they had large mansions. Their fishing-hooks were of tortoise-shell: their twine, cord, and fishing-nets, were well manufactured from the husks of the cocoa-nuts. The mats on which they slept, and which they threw

over them at rest, were formed of plaintain-leaf. At their meals they used a plaintain-leaf instead of a plate, and the shell of a cocoa-nut served them as a cup, which they sometimes finely polished. Their best knives were of mother-of-pearl, and others of a large muscle-shell, or split bamboo. They had also vessels of an oval shape and reddish-brown colour, which were a kind of earthen ware, and which they used for heating their water, and for boiling their fish, yams, &c. The principal weapons used in their battles were spears, about twelve feet long, formed of the bamboo, having its pointed end of very hard wood: these were barbed transversely, nor could they be drawn from the body without lacerating the flesh. Another weapon was the dart and sling; the sling was a piece of wood about two feet long, with a notch made in it, wherein the head of the dart was fixed. The dart was of bamboo, pointed with extremely hard wood. Their canoes were formed of the trunks of trees, and neatly ornamented. The natives of these islands are a stout, well-made people, rather above the middling stature; their complexions are of a far deeper colour than what is understood by the Indian copper, but not black. They are mild, affable, and industrious, and, like the inhabitants of Otaleite, they form an exception to the general rule of savage existence. Their hair is long and flowing, rather disposed to curl, which they mostly form into one large loose curl round their heads: some of the women, who wore remarkably long hair, let it hang loose down their backs. The men were entirely naked: the women wore only two little aprons, or rather thick fringes, one before and one behind, about ten inches deep and seven wide: these were made of the husks of the cocoa-nut stripped into narrow slips, which they dyed with different shades of yellow: this, which was their only dress, they tied round their waists, commonly with a piece of line, though such as were of higher rank used a string of some kind of beads. Both men and women were tattooed, or as they called it "melgothed;" an operation which is supposed to have taken place at a certain period of youth, children of either sex not being marked by it. The men had their left ear bored, and the women both; a few of the first wore beads in the perforated ear; the latter put either some leaf through, or an ear-ring of tortoise-shell inlaid. The cartilage between the nostrils was also bored in both sexes, through which they frequently put a little sprig or blossom of some plant or shrub that accidentally caught their fancy. When the men and women grew up, their teeth were blacked, which was done by means of some dye; and the operation was tedious and painful. For this purpose they used groundsel, with four other herbs, bruised together, and mixed with a little clinam into a paste, which was applied to the teeth every morning, in order to dye them black: the patients lying with their heads upon the floor, and letting the saliva run out of their mouths. At night the paste was taken away, and they were permitted to eat a little. The same process was repeated the day following, and five days were necessary to complete the operation. This occasioned great trouble, and made them extremely sick.

Persons of both sexes were very expert at swimming, and appeared to be as perfectly at ease in the water as on land. The men were admirable divers. Their marriages were probably no more than a civil contract, but at the same time the contract was regarded as inviolable. They allowed a plurality of wives, but in general had not more than two: the king had five, though not living together. They did not appear to be in any degree jealous of them, permitting them to partake of all their diversions. When a woman was pregnant, she always separated from her husband at night; and it was observed that the utmost attention was paid

paid to women in that situation. Their children are named soon after they are born; and probably without any ceremony. Some peculiar circumstances attended their funerals. At the place of interment, an elderly woman was observed to get out of the new made grave, who was supposed by those who attended to be the mother, or some near relation, who had been drawn by affection to the melancholy scene, in order to be satisfied that every thing was duly prepared. When the corpse was laid in the earth, the lamentation of the women that attended was very great. These last sad offices seemed to be wholly left to the tenderness of the weaker sex; the men only assembled round the body, before it was carried to the grave, where they preserved a solemn silence. They had places appropriated to sepulture. Their graves were made like ours in country church-yards; having the mould raised up in a ridge, over the place where the body was deposited, some flat stones raised above them, with a flat one laid horizontally over, and surrounded by a kind of hurdle-work, to prevent any one from treading over them. There seemed to be no religion of any kind among these islanders, though they have an idea that the soul survives the body. The government is in the hands of a king, under whom there are "rupaks," or chiefs, who also constitute a kind of nobles. The property of all the land is supposed to be vested in the sovereign, while that of the people is only personal, as a canoe, weapons, or rude articles of furniture. The king of Pelew entertained so great an esteem for captain Wilson, that he entrusted his second son, prince Lee Boc, to his care, to accompany him to England. This young man was of a most amiable disposition, desirous of information, and possessed a capacity for receiving it; he died of the small-pox at captain Wilson's house in London in the year 1784, at about twenty years of age. N. lat. between $6^{\circ} 54'$ and $8^{\circ} 12'$. E. long. between $134^{\circ} 5'$ and $134^{\circ} 40'$.

PELHAM, a township of America, in Hampshire county, Massachusetts; 12 miles N.E. of Northampton; incorporated in 1742, and containing 1144 inhabitants.—Also, a post-town of Rockingham county, in New Hampshire, on the S. state line, which separates it from Dracut, in Massachusetts; 30 miles S.W. of Exeter; incorporated in 1746, and containing 918 inhabitants.—Also, a township in West Chester county, New York, bounded S. and E. by the Sound, N. including New City, Hart, and Appleby's islands; containing 943 inhabitants.—Also, a township of Lincoln county, Upper Canada, S. of Louth, watered by the Chippewa or Welland.

PÉLHÉSTRE, PETER, in *Biography*, a considerable French writer, who flourished in the 17th and early part of the 18th centuries, was a native of Rouen, where he was born about the year 1645. At an early age he was inspired with the love of learning, and from thenceforward he devoted his life to studious pursuits. At the age of seventeen or eighteen he came to Paris, when the archbishop of that see sent for him, and said, "I am informed, sir, that you read the works of heretics; are you sufficiently learned to venture on such a dangerous practice?" To which the young man replied, "Your question, my lord, embarrasses me: for were I to answer in the affirmative, you might charge me with presumptuous vanity; and should I say that I have not sufficient learning, you would prohibit me from reading such books." Pleased with the ingenuousness of the answer, the prelate laid him under no restriction. For some time M. Pelhestre officiated in the clerical character, and was zealous as a missionary for the conversion of Protestants to Catholicism: he afterwards resumed the habit of a layman, which he did not change upon his appointment to the place of sub-librarian in the great convent of

the Cordeliers at Paris. His motive for accepting of this post, was the unrestrained access which it gave him to a valuable library. He became intimately acquainted with father Mabillon, and several other of the most learned persons of his time. He visited most of the religious solitudes in France, and said, if he were to seclude himself from the world, he should make choice of one of the principal monasteries on mount Athos, for the advantage of consulting the numerous Greek MSS. which they possess. When he had any particular object in view, it was usual for him to shut himself up in a room from which day-light was excluded, where he applied himself night and day, excepting when nature called for refreshment. Father Le Long was told that he had been seen frequently in this situation. He died suddenly in 1710, when he was sixty-five years of age. He was a man of prodigious reading, and particularly conversant in theological controversy, and the knowledge of ecclesiastical authors. He wrote a severe criticism on various passages in M. Dupin's "Bibliothèque des Auteurs Ecclésiastiques," and filled all the margins of Cave's "Historia Literaria" with notes. The manuscripts of these performances are said to have fallen into the hands of the Benedictines, to whom they would prove useful in their critical researches. He was the author of the numerous additions and valuable notes to the second impression of father Bonaventure's "Treatise on the best Method of reading the Fathers of the Church," in 1697. Moreri.

PELIALA, in *Ancient Geography*, a town of Aſia, in Mesopotamia, between Rhæſana and Alvanis. Ptolemy.

PELIAS, an island on the coast of Sicily, in the vicinity of the promontory of Drepanum.

PELIAS, in *Zoology*, a species of *Coleber*; which see.

PELICAN, in *Chemistry*. See PELLICAN.

PELICAN, in *Ornithology*. See PELECANUS.

PELICAN Island, in *Geography*, a small island near the S. coast of West Florida. N. lat. $30^{\circ} 14'$. W. long. $33^{\circ} 6'$.—Also, a small island near the N.E. coast of Antigua. N. lat. $17^{\circ} 14'$. W. long. $61^{\circ} 24'$.—Also, a small island near the S.W. coast of Antigua. N. lat. $17^{\circ} 10'$. W. long. $61^{\circ} 35'$.

PELICAN Islands, a cluster of small islands near the coast of West Florida. N. lat. $29^{\circ} 48'$. W. long. $88^{\circ} 55'$.

PELICAN Key, Great, a small island near the S. coast of Jamaica. N. lat. $17^{\circ} 49'$. W. long. $76^{\circ} 48'$.

PELICAN Key, Little, a small island near the S. coast of Jamaica, a little N. of the former island.

PELICAN Rocks, rocks on the N.W. coast of Antigua, lying under water, and dangerous.

PELICAN Shoals, sand-banks about half a mile from the shore, on the S.W. coast of the island of Barbadoes.

PELICARE, a town of Cochin; 50 miles E. of Cochin.

PELICARO, a town of Naples, in the Basilicata, at the mouth of a river that runs into the Adriatic; 10 miles E.N.E. of Tarfi.

PELICONDA, a town of Hindoostan, in the circar of Cicacole; 25 miles N.W. of Cicacole.

PELIGNI, in *Ancient Geography*, a people of Italy, between the Marmeni and the Marfi; sometimes comprehended under the name of Marfi. They were immediately descended from the Samnites, but owed their first origin to the Sabines. They are mentioned by Ovid, Faſt. l. iii. v. 95. As they inhabited the high mountains which formed a part of the Apennines, it is probable that they derived their name from the primitive *pal*, elevated. They are said to have constructed a temple to Jupiter Palenus. Their chief town was Corfinium; Salmo also was within their dominion.

PELIJARVI, in *Geography*, a town of Sweden, in the government of Kuopio; 100 miles S.E. of Kuopio.

PELIKANI, a town of Lithuania, in the palatinate of Wilna; 16 miles S.S.W. of Breslaw.

PELIM, a town of Russia, in the government of Tobolsk, on a lake of the same name; 72 miles N. of Turinsk. The lake is about 56 miles in circumference. N. lat. $59^{\circ} 10'$. E. long. $63^{\circ} 56'$. This lake receives a river, called also Pelim.

PELING, an island near the coast of Corea, in the Hoang-Hai, or Yellow sea; ten miles long, and four broad. N. lat. $38^{\circ} 24'$. E. long. $124^{\circ} 28'$.—Also, a small island in the East Indian sea, near the E. coast of Celebes; 50 miles long, and 14 broad. S. lat. $1^{\circ} 45'$. E. long. $123^{\circ} 20'$.

PELION, MOUNT, in *Ancient Geography*, a portion of that long chain of mountains which lay on the eastern coast of Thessaly, and which extended from the peninsula, inclosing towards the south the greatest part of the country called Magnesia, as far as the mountains that separated it from Macedonia. The portion which bore the name of Pelion commenced at the summit of Rhifus, and reached almost from the sea in advancing towards the N.W. In a kind of angle which this mountain formed in its return towards the E. at the bottom of the mountain flowed the small river Amyrus. The coast, in the direction of the mountain, formed in this place a small gulf, in which was Melibœa. From Melibœa, to the right bank of the mouth of the Peneus, the chain of mountains, which approached very near to the sea, was called Ossa. On the other side of the Peneus, in ascending towards the north, it formed two chains of mountains, one of which took the course of the sea very exactly, and the other inclined a little from the S.E. to the N.W. These two mountains were connected with the mountains which separated Thessaly from Macedonia. They were these two chains of mountains which the ancients comprehended under the name of Olympus. When the giants are said to have piled Ossa upon Pelion, the meaning seems to be, that they had fortified these two mountains, whither they retired after their excursions, and kept Jupiter's garrison upon mount Olympus in awe.

PELIOSANTHES, in *Botany*, from *πελιος*, *livid* or *lurid*, and *ανθος*, a *flower*, a recently established East Indian genus, so named by the late Mr. George Jackson, in Andrews's Repository, in allusion to the pale lead-colour, for which the flowers are remarkable. Andr. Repof. v. 9. 605. Ker in Curt. Mag. v. 32. 1302.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Sarmentaceæ*, Linn. *Asparagi*, Juss.

Gen. Ch. *Cal.* none, unless the corolla be taken for such. *Cor.* inferior, of one petal, permanent; tube cylindrical; limb wheel-shaped, in six equal, obovate segments. Nectary of one leaf, globular, contracted at the mouth, one-third the length of the petal. *Stam.* Filaments very short, equal, inserted into the inside of the nectary; anthers oblong, of two lobes and two cells, projecting just beyond the nectary. *Pist.* Germen superior, enveloped in the nectary, globose; style scarcely any; stigma of three obtuse furrowed lobes. *Peric.* Berry ovate, of three cells. *Seeds* two in each cell, some of them frequently abortive.

Eff. Ch. Corolla tubular; limb wheel-shaped, in six segments. Stamens inserted into the globular nectary. Berry with three cells, and six seeds.

1. *P. Teta*. Grey-flowered Teta. Andr. Repof. t. 605. Curt. Mag. t. 1302.—Flower-stalks taller than the leaves. Corolla obtuse.—Gathered by Dr. Roxburgh in Bengal. Living plants were sent by him to the late Lady Amelia Hume, in whose stove they flowered in the following spring,

for the first time in England. *Root* fibrous, perennial. *Stem* none. *Leaves* several, radical, erect, a foot or more in height, on channelled stalks, elliptical, pointed at each end, entire, rather rigid, evergreen, smooth, plaited, with many longitudinal ribs, and fine transverse veins. *Flower-stalks* several, taller than the leaves, erect, round, simple, smooth, somewhat glaucous, each bearing an upright cluster of numerous inodorous small flowers, scattered or in tufts, of a livid purplish lead-colour, intermixed with dull green. *Braçæas* scattered, ovate, pointed, concave, membranous, pale. The flowers fall off even before they wither, without producing any fruit in this country. The natives of Bengal know this plant by the name of *Teta*, but we find nothing recorded of its qualities or virtues.

2. *P. humilis*. Dwarf Teta. Andr. Repof. t. 634. Curt. Mag. t. 1532.—Flower-stalks shorter than the leaves. Cluster simple. Corolla acute.—Introduced from Prince of Wales's island, about the year 1808, by Mr. Evans of Stepney, in whose hot-house it blossomed in November. This differs from the former in its much humbler stature, the leaves being not more than three inches high, and the flower-stalk hardly two inches, bearing an ovate, dense, simple cluster of flowers, whose segments are acute, green with a white edge.

Mr. Jackson has recorded, in Andr. Repof. v. 9. 605, that he had seen two species in Mr. Evans's collection just imported from Prince of Wales's island, one of which had the leaves nearly of a blue colour. The other probably was our *humilis*. Mr. Evans's collector declared that he had found five or six distinct species of this genus, growing wild in the island just named, though he did not succeed in his attempt to bring them alive to England.

PELL, JOHN, in *Biography*, a divine of the church of England, was born at Southwick, in Suffex, in the year 1610. He was educated in grammar-learning at the free-school of Steyning, in the same county, and made so rapid a proficiency in the Latin and Greek languages, that at the early age of thirteen he was fully qualified for entering upon academic studies, and was sent to Trinity college, Cambridge. Here he exhibited a wonderful facility in acquiring languages, and at the same time shewed a peculiar turn for mathematical learning; so that, in 1629, when he was only eighteen years of age, he drew up "A Description and Use of the Quadrant, in Two Books." In the same year, he held a correspondence with the celebrated Mr. Henry Briggs upon the subject of logarithms, and in the following year he wrote "Modus supputandi Ephemerides Astronomicas (quantum ad motum Solis attinet), paradigmata ad ann. 1630, accommodato;" and "A Key to unlock the Meaning of Johannes Trithemius, in his Discourse of Steganography," which he communicated to Mr. Samuel Hartlib and others. He had been admitted to the degree of B. A. at the usual period, and in the present year he proceeded M. A. During this year he wrote "A Letter to Mr. Edmund Wingate, on the Subject of Logarithms." In 1633-4, he finished his "Astronomical History of Observations of Heavenly Motions and Appearances;" and soon after his "Ecliptica Prognostica, teaching how, by Calculation, to foreknow and foretell all Sorts of Eclipses of the Heavenly Lights." By these and other works, which it is not necessary to enumerate, Mr. Pell's reputation for mathematical knowledge was so well established, that he was considered to be deserving of a professor's chair in that science. When, therefore, a vacancy took place in one at Amsterdam in 1639, interest was made to procure Mr. Pell the appointment. The vacancy was not, however, filled up before the latter end of the year 1643, when Mr. Pell was chosen to it. Of the estimation in

in which he was held in Holland, a good opinion may be formed from what was said of him by his colleague, Gerard John Voffius, who styles him a person of various erudition, and a most acute mathematician, and he greatly applauds his lectures upon Diophantus.

In 1644, Mr. Pell published at Amsterdam, in two pages, a refutation of Longomontanus's pretended quadrature of the circle, which obtained for him a high degree of credit among the most learned mathematicians in Europe. Two years afterwards, Mr. Pell was called to the display of his talents on a new scene; for the prince of Orange, having founded a *Schola illustris* at Breda, invited him to be professor of philosophy and mathematics in the new institution, with an annual salary of a thousand guilders. This offer he accepted, and he filled the mathematical chair at Breda with the same reputation and success which attended him at Amsterdam, having, among his pupils, several who were afterwards distinguished as eminent algebraists.

In 1652 he returned to England, and in 1654 Cromwell appointed him agent to the Protestant cantons in Switzerland, which character he retained till the death of the protector. After the restoration, he was encouraged to enter into holy orders; and, having been ordained deacon and priest in 1661, he was immediately instituted to the rectory of Fobbing, in Essex, with the chapel of Battlefen annexed, on the presentation of the king.

In 1663 he was presented by Dr. Sheldon, then bishop of London, to the rectory of Laingdon, in Essex, and about the same time he was created doctor of divinity. Scarcely had he been honoured with this degree, before his patron was translated to the see of Canterbury, and Dr. Pell became one of his domestic chaplains. Such an appointment is generally considered to be a step to higher preferment, but Dr. Pell was so intent on his studies as to neglect his own interest, and it is said he was so imprudent, with respect to the management of his worldly affairs, that he would have disgraced the station of a dignitary. Anthony Wood says, "that he was a shiftless man, and his tenants and relations dealt so unkindly with him, that they cozened him of the profits of his parsonages, and kept him so indigent, that he wanted necessaries, and even paper and ink to his dying day."

In the mean time he distinguished himself as a fellow of the Royal Society, to which he had been elected in the year 1663. He published several other works in mathematical science, and was the inventor of some algebraical signs, of which a few have obtained a general reception, *viz.* \div for division; \odot for involution, and \therefore for ergo, or therefore. In the midst of his incessant application to his studies, owing to the neglect of his pecuniary affairs, his embarrassments increased, and he contracted debts which occasioned him more than once to be thrown into the king's bench prison. He died in 1685, in the 74th year of his age. Besides the various labours already noticed of this gentleman, he wrote a demonstration of the second and tenth books of Euclid, and also of Archimedes' *Arenarius*, and the greatest part of Diophantus' *Arithmetic*. He left behind him a great number of manuscripts, which were, after a considerable time, obtained for the Royal Society: the collection contains not only Dr. Pell's mathematical papers, letters to him, and copies of those sent by him, but also several manuscripts of Mr. Walter Warner, an eminent philosopher and mathematician in the reigns of James I. and Charles I.

PELLA, in *Ancient Geography*, a town of Macedonia, near the sea, on the confines of Emathia. This city became the capital of the kingdom when Edeffa was annihilated according to Ptolemy, and owed its grandeur to Philip, who

had been educated there, and to his son Alexander, who was born in this place. Livy describes it as situated on an eminence surrounded by marshes, in the midst of which was a fortress, appearing like an island, and at a distance seeming to be joined to the city; it was, however, separated from it by a river, which ran between their walls, and over which there was a bridge of communication. This river was called Lndias, Luedias, and Lydius. Pella became a Roman colony. Alexander derives from this city the appellation of Pellæus.—Also, a town of Greece, in Thessaly.—Also, a town of Judea, in the half tribe of Manasseh, on the other side of Jordan; situated on the torrent of Hieromaces, and forming one of the boundaries of Peræa. This town is placed in Cœlesyria by Steph. Byz. and in the Decapolis by Pliny.—Also, a town of Greece, in Achaia.—Also, a town, and a mountain of Ethiopia.

PELLA, in *Geography*, a town of Russia, at the junction of the Tofna and Neva; 20 miles S.E. of Petersburg.

PELLA, in *Ornithology*, a species of *Trochilus*; which see.

PELLACK, in *Zoology*, the name of a young spout whale, often found in Zetland; where they run into creeks, and so entangle themselves among the rocks, that they are cast on shore, or easily taken. Phil. Trans. N^o 473, sect. 8.

PELLACONTA, in *Ancient Geography*, a river of Asia, in Mesopotamia. Pliny.

PELLACOPAS, a river of Asia, in Mesopotamia. Arrian de Exped. Alex.

PELLAEUSPAGUS, a name which Alexander gave to the district in which was situated the town of Alexandria, which he built at the mouth of the Tigris.

PELLAGE, in our *Old Writers*, a custom or duty paid for skins or leather.

PELLAGRA, in *Medicine*, probably from *pellis*, the skin, and *agria*, scabies fera, a sort of cutaneous disease, which was first described about the year 1771 by some Italian physicians, as occurring in many persons in the neighbourhood of Milan and Venice.

The disease appears to have been a species of *lepra* or *psoriasis*; since, in common with these diseases, it commenced about the head and on the extremities with small red patches, upon which scales were afterwards formed, and sometimes chaps and fissures succeeded. This eruption is said to appear first in the spring or summer, and to disappear with the return of cold weather; but it recurs with renewed violence in the following spring. Subsequently, it is affirmed, though the cutaneous affection ceases to be very troublesome, the nervous system becomes greatly deranged; languor, syncope, depression of spirits, and ultimately melancholy, and actual insanity, in which the patients have a particular tendency to drown themselves, ensue, and they sink under a failure both of the mental and corporeal powers.

There is something bordering upon the marvellous in this history of the pellagra; and as we have heard nothing of the disease in later times, when credulity is diminished and observation improved, it may perhaps be concluded, that the disease, to which this new name has been given, is nothing more than the common *lepra* or the *psoriasis*, and that the nervous affections, said to be connected with it, were in reality accidental and independent of it. A full account of the disease may be found in Frapolli, "Animadversiones in Morbum, vulgo Pellagram dictum," Milan 1771, (the first writer who noticed it); and in an essay by W. X. Janfen, "De Pellagra, Morbo in Mediolanensi Ducatu endemio," Leyden 1787. (This essay was reprinted in Dr. Frank's "Delectus Opusculorum Medicorum," vol. ix. art. 9.) See also

also a long list of references to Italian writers on the subject, under the article *Pellagra*, in Dr. Parr's London Medical Dictionary. See *LEPROSY* and *PSORIASIS*.

PELLANA or **PELLANE**, in *Ancient Geography*, a town of Laconia, S.E. of Belemina. It was washed by the Euratas; and is thought to have been very ancient. In the time of Pausanias it had a temple of Esculapius and a fountain called "Pellanide."—Also, a town of the Peloponnesus, in Arcadia.

PELLEGRIN, **SIMON JOSEPH**, in *Biography*, a French poet and ecclesiastic, was born at Marseilles. He obtained, in 1704, the prize of the academy for his "Epistle to the King on the Success of his Arms." He entered into the religious order of the Servites, but afterwards he obtained leave to remove into that of Cluny. He wrote several pieces for the theatres, and dramatized the history of the Old and New Testament, the Psalms of David, &c. He is also known as the translator of the works of Horace into the French language. He died in 1745.

PELLEGRINI, **CAMILLO**, a learned historian and antiquarian, was born in 1598 at Capua. He was educated at the Jesuits' school at Naples, where, besides the usual studies, he acquired an accurate knowledge of civil and ecclesiastical law and theology. He entered into the clerical order, and having been sent to Rome, he diligently consulted the archives and libraries of that capital, and formed the design of collecting all the ancient documents relating to his native place, and to the whole kingdom of Naples. For this purpose he made many journies, and was at great expence in procuring copies of records and manuscripts, and in forming a collection of antiquities. The first fruit of his labours was "L'Apparato alle Antichità di Capua," printed in 1651, in which he minutely describes all the parts of Campagna Felice, and relates its history and several revolutions. He afterwards published a work entitled "Historia Principum Longobardorum," containing the chronicle of the Anonymus Salernitanus, and several other historical pieces which had not yet seen the light, illustrated with learned annotations and dissertations. This publication was of great service in elucidating of the history not only of those provinces of Naples which were under the sway of the Lombard kings, but of Italy; it was therefore republished in the collections of Burmann and Muratori, and has been re-edited, with various additions, at Naples, 1749, by Sig. Fr. Moria Pratiini. This learned writer published other works on different subjects, and had a great collection of MSS., as well of his own writing as others, which were unfortunately lost to the world by the following incident. Being in a bad state of health, he had given orders to a female domestic, that when he should be near his end, she should burn a large bundle of papers which he pointed out. One day overhearing the physicians prognosticate that he had not many hours to live, she too faithfully executed his commands, to his own great regret, after he was somewhat recovered. He died at Naples in 1660, at the age of 65.

PELLEGRUE, in *Geography*, a town of France, in the department of the Gironde, and chief place of a canton, in the district of Le Réole; 12 miles N.N.E. of Réole. The place contains 1882, and the canton 6487 inhabitants, on a territory of 145 kilometres, in 17 communes.

PELLEN, a town of Prussia, in the circle of Natanen; 16 miles S. of Brandenburg.

PELLENA, in *Ancient Geography*, a town of the Peloponnesus, in the Argolide.

PELLENDORF, in *Geography*, a town of Austria; 10 miles W. of Zitterdorf.—Also, a town of Austria; 8 miles S.E. of Vienna.

PELLENE, in *Ancient Geography*, a town of the Peloponnesus, in Achaia, S. of Aritionautæ. It was built round a mountain, and formed a beautiful amphitheatre. The inhabitants pretended that it took the name from Pallas, one of the Titans; but the Argians with greater probability ascribe its name to Pellené, the son of Phorbas, and grandson of Triopas, who came from Argos to this place. Water was conveyed to this city by a beautiful aqueduct; and at a small distance was a gymnasium. In this city were the statues of some famous athletes. Charon was one of them, and he, seduced by Alexander, assumed the sovereign authority, so that his country detested him as a tyrant, whilst they honoured and crowned him as a victorious athlete. Near this town was a temple, on a spot consecrated to Neptune. About two leagues towards the S.E. from Pellené was a famous temple of Ceres the Mysian. In its vicinity feasts were celebrated for seven days, and after the third day no male could be found within the precincts of the temple. During the night the remaining females offered sacrifices, and performed other ceremonies. The men afterwards returned and associated with high satisfaction after this separation. Pellené was defended by a fortress called Olurus towards the S.E., and by the valour of its inhabitants long maintained its liberty; at length it became a part of Sicyonia, retaining its liberty to the time when the Romans took possession of Greece.

PELLENÉ, in *Mythology*, an epithet of Diana, given to her by the inhabitants of Pellené; and upon this occasion Plutarch tells us (in the life of Aratus), when her statue was carried in the processions, her aspect became so terrible that no one durst look upon it.

PELLENINKEN, in *Geography*, a town of Prussian Lithuania; 9 miles N.E. of Insterburg.

PELLERIN, **JOSEPH**, in *Biography*, an eminent medalist, born at Paris in 1683, was commissary-general and first clerk of the French marine. Having obtained his dismissal after forty years' service, he devoted the remainder of his life to the study of antiquity. His collection of medals was the richest and most valuable that was ever made by a private individual. It was purchased by the king in 1776. He contributed to the promotion of the numismatic science by a publication in nine volumes 4to. enriched with a great number of plates. It consists of a collection of medals of kings hitherto inedited or little known; a collection of medals of people and towns, inedited or little known; miscellaneous medals, supplements to the above, and letters on medallic subjects. It is reckoned a very valuable work, not only on account of the beauty of the engravings, but of the learned and judicious explanations subjoined. The author died at Paris in 1782, in the 99th year of his age.

PELLERIN, **Le**, in *Geography*, a town of France, in the department of the Lower Loire, and chief place of a canton, in the district of Paimbœuf; 12 miles S.E. of Paimbœuf. The place contains 1456, and the canton 837 inhabitants, on a territory of 152½ kilt. metres, in 7 communes.

PELLETS, in *Heraldry*, a name given to those roundlets which are black, called also *ogresses* and *gun stones*.

PELLICAN, or **PELICAN**, among the *Chemists*, a kind of double vessel, ordinarily of glass: used in working on liquors, by circulation.

It has a tubulated capital, from which two opposite and crooked beaks pass out, and enter again at the belly of the incurbit. Two marasses, the mouth of one of which is inserted into the mouth of the other, answer the same purpose with this vessel.

PELLICAN also denotes an instrument used by surgeons, &c. to draw teeth.

PELLICAN.

PELLICAN, again, is the name of an ancient piece of ordnance, carrying a ball of six pounds; by the French made eight feet and a half, and by the Dutch nine feet long. See CANNON.

PELLICER, JOSEF DE OSSAU, SALAS Y TOBAR, in *Biography*. a man of considerable eminence in the literary history of Spain, was born at Saragossa April 22, 1602, and inherited a disposition to letters from his father D. Antonio Pellicer de Ossau, who left in MS. an epitome of Garibay's Great History, and a poem, entitled "Batavia Rebelde." He took an honorary degree at Alcalá, and from thence removed to Salamanca, and at the age of 22 took up his residence at Madrid, and in 1629 he was made chronicler or historiographer of Castile. The states of Arragon named him to the same office for their kingdom; but as it was already held by Francisco Ximenez de Urrec, it was decided that the reversion could not be granted; Philip IV. made him amends by creating him arch-historiographer for the kingdoms of the crown of Arragon; the duty attached to this office was to revise and correct the works of the chroniclers of the particular kingdoms. As a farther token of respect, the habit of the order of Montesa was given him, and afterwards exchanged for that of Santiago. These honours were far from profitable to the wearer, and Pellicer was all his life poor. He died at the age of 77, worn out, according to the reports of his biographers, by incessant literary application. He was author of a great number of works, the titles of which, some time previously to his death, filled five folio pages. His learning is generally acknowledged, and his learned works are still consulted by the literati of different countries. Gen. Biog.

PELLICULA, in *Vegetable Physiology*, is a fine skin, which closely adheres to the proper *testa*, or skin, of some seeds, constituting an additional integument, concealing their proper colour and naturally polished surface. Gærtner improperly calls it *epidermis*; a name appropriated to the whole cuticle of the vegetable, as well as animal, body. This part is either membranous, and often downy, as in *convolvulus*; or mucilaginous, and not perceptible till the seed is moistened, as in *Salvia verbenaca*. The latter is a curious instance of such a pellicle; and the seed is, in consequence, endowed with the, often very useful, property of extracting any small irritating body from the human eye. One seed, introduced under the closed eyelids, soon becomes, by the absorption of moisture into the pellicle, enveloped with a mass of jelly, that usually entangles and sheathes the obnoxious substance. We cannot but consider the *utriculus* of Gærtner, which covers the seed in *Cbenopodium* and some of its allies, as no other than a *pellicula*.

PELLISSON, FONTANIER PAUL, in *Biography*, an eminent French writer, born at Beziers in 1624, was descended from a family of great respectability in the profession of the law. The subject of this article lost his father at an early age, and he was left to the care of his mother, who educated him in the principles of the Protestant religion. He studied successively at Castres, Montauban, and Toulouse, and acquired an intimate knowledge of the best authors in the ancient and modern languages. He applied himself professionally to the study of the law, and had already appeared with distinction at the bar, when he was seized with the small-pox. This cruel disease left a permanent weakness in his eyes, and so disfigured him, that he became a model of ugliness. He quitted the bar and retired into the country for some time; afterwards he came to Paris, and made himself known as a man of letters. In 1652 he obtained the place of a king's secretary, and applied with diligence to the affairs of the council, with which

he became intimately acquainted. In the same year he read before the French academy an history which he had composed of that institution, and which was so much approved that a resolution was made to admit him a member on the first vacancy, and in the mean time to give him the privilege of being present and speaking at the meetings of the academy. His history was printed in 1653, and many successive editions of it were given. It is upon the whole a curious and interesting performance. M. Pellisson was brought into a conspicuous situation in the year 1657, by being appointed first clerk to the celebrated intendant Fouquet. The financial business into which he was now plunged did not impair either the disinterestedness of his character, or the amenity of his disposition. His services were recompensed in 1660 by admission into the council of state, but in the following year he was involved in the fall of his patron, and, as having been one of his principal confidants, was committed to the Bastille. As it was found impossible to corrupt his fidelity to his former master, attempts were made to worm out his secrets by means of a German, a supposed fellow prisoner, who concealed craft under a gross and simple exterior. Pellisson was soon aware of his artifices, and treated him with so much politeness, that he converted him into a friend, and by his means kept up a constant correspondence with mademoiselle de Seuder. During his imprisonment, he composed three memoirs in favour of Fouquet, which are reckoned among the most eloquent and best-written pieces of the kind in any language, and have conferred a lasting honour on his memory. They were, however, the immediate cause of increased rigour in his confinement. He was prohibited the use of pen, ink, and paper, and was reduced to write with the lead of his casement upon the margins of books, or to use a kind of ink which he made with burnt crust tempered with wine. His whole company was a Basque, whose only talent was playing on the bagpipe. With vast pains he trained a spider to come out of his hole at the sound of this instrument, and take flies from his hand. Books of controversy were another employment of his solitary hours, and he received in the Bastille those impressions which afterwards produced a change of religious profession. He preserved many friends in this forlorn situation; and Tannequi le Fevre had the courage to dedicate to him, while in his dungeon, his "Lucretion," and his translation of Plutarch's treatise on "Superstition." At length, after a confinement of four years and a half, he obtained his liberty, and thenceforth passed his life in lavishing praises upon the sovereign who had previously deprived him of it. He was taken into favour, obtained a royal pension and a brevet of entrèe, and was made king's historiographer. His public recantation of the Protestant religion is supposed to have been one of the conditions of this favour. He soon after took the order of sub-deacon, and was presented to an abbacy and a rich priory. It was with some reason, therefore, that he annually celebrated his reconciliation with the church of Rome. He gave a more interesting proof of the excellence of his disposition by commemorating the anniversary of his liberation from the Bastille with the annual release of some of the prisoners.

In 1671, Pellisson delivered at the French academy a "Panegyric on Lewis XIV." which was translated into several languages, and even into the Arabic, by a patriarch of mount Lebanon. He accompanied his royal master in his campaigns, and for some time was the only man of letters engaged in writing his history; but some offence which he gave to madame de Montespan induced the king to transfer the appointment of historiographer royal to Boileau and Racine. Although Pellisson was thus deprived of his office,

he was ordered to proceed in his own historical labours; and he produced a "History of Lewis XIV., from the Death of Cardinal Mazarin in 1661, to the Peace of Nimeguen in 1678," in three vols. 12mo. It is more the work of a courtier than that of a faithful historian, yet it has been spoken of with applause by Voltaire and others. He totally disapproved of the dragooning system of proselyting, and he seems to have relied much more on the judicious distribution of the third of the savings destined by the king for rewards to such as should conform to the established religion. He also employed his pen in controversy, and wrote "Reflexions sur les Differences de la Religion," and "Traité de l'Eucharistie," which were composed with much art, and in a laudable tone of moderation.

After this Pellisson was made master of requests, and passed all the latter part of his life in great credit and prosperity. He died in February 1693. Besides the works above-mentioned, he wrote several pieces in verse and prose, among which were an "Abridgment of the Life of Anne of Austria;" "Lettres Historiques," being a journal of the king's journeys and encampments; "Recueil des Pieces galantes;" "Poésies Chrétiennes et Morales." Moreri. Bayle.

PELLITORY of Spain, in *Botany*. See ANTHEMIS.

PELLITORY, *Baslard*. See ACHILLEA.

PELLITORY, *Double*. See ACHILLEA, and YARROW.

PELLITORY of the Wall. See PARIETARIA.

PELLONIA, in *Mythology*, a goddess invoked at Rome, when her votaries wished to be delivered from their enemies, or from any thing that annoyed them.

PELLOUTIER, SIMON, in *Biography*, pastor of the French Protestant church at Berlin, member and librarian of the academy in that capital, and ecclesiastical counsellor, was born at Lepsic in the year 1694. He filled with high reputation the posts confided to him, and obtained a high character for erudition by his work entitled "Histoire des Celtes, et particulièrement des Gaulois et des Germains, depuis les temps fabuleux jusqu'à la Prize de Rome par les Gaulois." Of this work, which is replete with learned and curious research, the best edition is that of M. de la Bastide, in eight vols. 12mo. and two vols. 4to. Pelloutier likewise enriched the Memoirs of the Berlin academy with a number of valuable papers. He died in 1757, highly respected and beloved for his learning and beneficence.

PELLS, *Clerk of the* PELLs. See CLERK of the Pells.

PELLS, *Comptrollers of the*. See COMPTROLLER.

PELLUCID, formed of *pelluceo*, or *perluceo*, I shine through, a term of the same import with diaphanous, or transparent.

Pellucid stands opposed to opaque.

PELLUCIDITY, diaphanetty, or transparency, &c.

PELODES, in *Ancient Geography*, a port of Epirus, between the gulf of Buthrotori and the promontory of Thyamis. Ptolemy.—Also, a gulf of Asia, in Sufiana.

PELONTIUM, a town of Spain, in the Tarragonensis and country of the Lingones. Ptol.

PELOPE, a town of Asia Minor, in Lydia, on the confines of Phrygia. Steph. Byz.

PELOPIA, *πελοπια*, in *Antiquity*, a festival celebrated by the Elæans, in honour of Pelops, for whom that nation had more veneration than for any other hero.

PELOPIDAS, in *Biography*, an illustrious Theban leader, was the son of Hippoclus, of a distinguished family in Thebes. Though brought up in affluence, he adopted a frugal and simple mode of living, and emulated, in private and public virtue, his noble friend Epaminondas, though he had less mental cultivation than that hero. He married and

had several children, but was more intent upon serving the state than improving his fortune. He made a campaign with the Theban auxiliaries, who marched to the aid of the Spartans in the Peloponnesian war, and in a battle fought at Mantinea, he received several wounds, and would have been killed, had he not been protected by Epaminondas. After this period, the citadel of Thebes being betrayed to the Spartans, Pelopidas with many of his friends saved their lives by flight. They took refuge in Athens, whence they kept up a correspondence with those of their friends who remained at Thebes. Pelopidas, animated with the love of liberty and his country, was continually urging his fellow exiles to attempt the recovery of their native city out of the hands of foreign and domestic tyrants, and at length a plan was formed to collect the exiles, and to endeavour to effect a revolution. Pelopidas undertook to be the leader of this bold enterprize; and accordingly, with only eleven associates, he left Athens on a certain day in the middle of winter, and proceeded to Thebes. The party were in the habits of peasants, with dogs and hunting poles, as if they were from the country on an hunting expedition. Thus disguised, they entered Thebes in the midst of a heavy fall of snow, which kept the mass of the people within doors; here they were immediately joined by about thirty or forty others, who were apprized of their approach. The two Theban rulers were at an entertainment given purposely by Phylidas; and although they received an intimation of the entrance of some exiles they paid little or no regard to the fact. A letter disclosing the whole conspiracy was received by Archias, one of the rulers, from an Athenian friend; but although he was told that it contained matter of great importance, he threw it under the bolster of his couch, exclaiming "Business to-morrow!" which afterwards became a proverbial saying. Whilst these persons, half intoxicated, were easily dispatched by some of the conspirators, who entered the room in female habits, Pelopidas and his party had the more difficult task of breaking into the houses of two others of the supporters of tyranny and overpowering them. When this was effected, they sallied out into the streets, proclaiming liberty to all the Thebans, and arming all who joined them out of the shops of the armourers. On the next morning, they were joined by the body of exiles from Athens, and Epaminondas, who had obtained from the bloody scenes of the night, having collected all the most respectable citizens, put an end to the confusion and avowed the common cause. Pelopidas, who was universally hailed as the deliverer of Thebes, was placed at the head of affairs, and at his intigation measures were taken to recover the citadel from the Lacedæmonian garrison. The fortress was surrounded, and compelled to surrender for want of provisions. The date of this revolution, which was the commencement of the Theban glory, is fixed at the first year of the 100th olympiad, or the year B.C. 380. In the subsequent war with Sparta, Pelopidas exercised all the talents of a brave and able general. He defeated the enemy at Tanagra, in which he slew their general with his own hand. Pelopidas is considered as the first who inspired the Thebans with the ambitious desire of rising to distinction among the states of Greece, and extending their power by conquest. His military fame was of an earlier date than that of Epaminondas, though the latter came in time to be superior. It is, however, to the honour of both, that they lived in perfect amity, and concurred in every measure for the advancement of their country. Before the battle of Leuctra he supported with his voice the advice of Epaminondas for an immediate engagement, and at the head of the sacred band he greatly contributed to the success of the day. He was joint-commander with that chief

in the expedition into the Peloponnesus, in which the city of Messene was restored, and partook with him the danger of a charge made against them on their return, for having illegally prolonged their command.

The Thebans having requested the aid of the Thebans against the tyrant Alexander of Phœæ, Pelopidas was sent with an army into that country, and brought the king to terms. He afterwards marched into Macedonia, as arbitrator of a dispute in the royal family of that country, and the opinion entertained of his equity was such, that he was entrusted with a number of noble hostages for the purpose of securing tranquillity, among whom was Philip, father of Alexander the Great. He went a second time into Macedonia, where new tumults had arisen; and obliged Ptolemy, the usurper of the throne, to give his own son, with fifty others, as hostages for performing the conditions enjoined him. Returning through Thessaly with a small escort, he met with Alexander the Phœæan at the head of his army, and with his colleague Ismenias went to him unarmed, trusting to the sacredness of their character as ambassadors. The tyrant, however, seized their persons, and took them with him as prisoners to Phœæ. The spirit of Pelopidas supported him under this misfortune, and he even sent messages of defiance to Alexander, telling him that he acted very absurdly in putting to death so many of his own innocent subjects, and at the same time sparing him, who, he might be sure, would severely punish him for his perfidy, should he ever get out of his hands. Alexander, in return, asked "Why is Pelopidas in such haste to die?" "In order," the hero replied, "that by my death thou mayest become the sooner hateful both to gods and men, and thus brought to destruction." Soon after this, Epaminondas was placed at the head of an army, with orders to invade Thessaly, and proceed against the tyrant. It was the object nearest his heart to extricate his friend from the peril that threatened him; therefore he forbore pushing the Phœæan to extremities, and by alternately acting upon his hopes and fears, brought him to consent to a truce, with the condition of releasing Pelopidas and Ismenias; after this was performed, he marched with them back to Thebes. The Thebans having discovered that the Athenians and Lacedæmonians were negotiating a treaty against them with the king of Persia, sent Pelopidas to counteract it. He was received with great honour at the Persian court, and completely succeeded in confirming the former friendship between it and the Thebans, and in obtaining a declaration in favour of the liberty and independence of Greece.

Alexander continuing to oppress his neighbours, deputies were again sent to Thebes, requesting that forces might be sent to their aid, with Pelopidas to command them. An army was levied for the purpose; but as it was about to march, an eclipse of the sun struck a superstitious terror into the minds of the Thebans; and Pelopidas, not choosing to proceed with a disheartened army, took with him only 300 volunteer cavalry, and entered Thessaly, disregarding the warnings of the soothsayers. When he arrived at Pharfalus, he assembled all the Thebans who were the opposers of the tyrant, and marched in quest of Alexander. The latter, knowing that he had few Thebans with him, did not hesitate to meet him with a very superior force. The battle commenced, and while the event was still dubious, Pelopidas saw Alexander at some distance, rushed forwards, and loudly challenged him to single combat. The tyrant, however, thought it more prudent to shelter himself among the thickest of his troops, than to risk the trial. The noble-minded Theban, hurried away by an inconsiderate thirst of revenge, followed him almost alone, and beat down a number of his

opposers; at length, covered with darts, and pierced through with spears, he fell dead, a victim to unrestrained ardour. The Thebans lamented him as their father, saviour, and instructor, and the Thebans and allies joined in their expressions of sorrow. They, however, revenged his death by a total and bloody defeat of the enemy. His body was met in procession by the magistrates of the towns, the priests and young people bearing trophies and garlands; and the Thebans made an urgent request to be allowed to give it a funeral in their own country, which was granted, and performed with great solemnity and splendour. This event took place B.C. 364. Plutarch. Univer. Hist.

PELOPIS, in *Ancient Geography*, a name given to seven small islands, situated on the coast of the Peloponnesus, over-against Methuna, according to Pausanias.

PELOPONNESUS, a peninsula in the south part of Greece, joined to the continent by an isthmus, formerly denominated the isthmus of Corinth, and in later times Examili. The peninsula now bears the name of Morea. The ancients called it by different names, of which the most known are Apia, the Argolide, and Pelasgia. The Peloponnesus was divided into several parts, which formed separate states; these were Laconia, Messenia, the Argolide, the Elide, Achaia, Sicyonia, Corinth, and Arcadia in the centre; all the others were washed by the sea. Its form was very irregular; its length from N. to S. was about 125 geographical miles; and its breadth about 150 miles. The ancients compared it to a plantain leaf, and some of its inhabitants have represented it under this form on their coins. The medals of the Peloponnesus had for their type a tortoise. The name of Peloponnesus signifies the isle of Pelops; and accordingly the Greeks ascribed its origin to a hero named Pelops, who migrating from Asia took possession of this part of Greece, and gave it his name.

The Greeks were divided into two nations, viz. the Dorians and Ionians. In the best days of Greece, the Dorians had under their dominion the greatest part of the Peloponnesus, and a column was erected in the midst of the isthmus, upon which was engraved, towards the side of Athens, "this is not the Peloponnesus, but Ionia," and on the side towards Corinth, "this is Peloponnesus, and not Ionia." Notwithstanding its small extent, the Peloponnesus was, for a long time, the most considerable portion of Greece. The principal gulfs in its circuit were, the "Sinus Corinthiacus," or gulf of Lepanto; the "Sinus Cyparissus," or gulf of Arcadia; the "Sinus Messeniacus," or bay of Coron; the "Sinus Laonicus," or gulf of Colochina; the "Sinus Argolicus," or gulf of Napoli; and the "Sinus Saronicus," or gulf of Eugia. The chief promontories were, the "Promontorium Scyllæum," or cape Skilleo; the "Promontorium Malea," or cape Malio; and the "Promontorium Tænarium," or cape Motapan. See the article GRÆCIA.

PELOPS, in *Ancient History*, the son of Tantalus, king of Lydia, who is said to have been the last foreigner who arrived in Greece before the destruction of Troy. This prince, forced to fly from his country on account of the war which Tros had waged with him, to revenge the rape of Ganymede, retired into Greece, where he married Hippodamia, the daughter of Oenamaus, king of Pifa, ascended the throne, after the death of his father-in-law, and communicated his name to that part of the peninsula, which was from that time called *Peloponnesus*, (which see.) But his dominion extended also to Ætolia, and by his immense wealth he became one of the most powerful kings of Greece. The era of Pelops's arrival in Greece must have been about the 110th or 120th year before the Trojan war. Among other

fatalities of Troy, it is said that it could not be taken by the Greeks, unless they had the bones of Pelops; and they therefore sent for them to Pifa where he had been interred. The vessel was shipwrecked in its return, and some time after a peasant found upon the shore the shoulder of that prince, and hid it under the sand. The Elæans having gone to the temple of Delphos to consult the oracle, in order to be delivered from the plague, the priests ordered them to go and dig up the bones of Pelops; and perhaps, in memory of this event, they made an ivory shoulder, which they consecrated to Ceres, and the Pelopidæ bore it afterwards upon their ensigns. Some of the ancient fathers contend that the palladium of Troy was made of Pelops's bones. The fable says, that the horses which drew Pelops's chariot had wings, and that they had been given to him by Neptune, the meaning of which is, if we believe Pindar and Palæphatus, that Pelops made use of a ship with sails to carry off Hippodamia.

PELORIA, in *Antiquity*, feasts instituted by Pelorus, and celebrated by the Thesalians. They had a considerable affinity with the Saturnalia; for in these the masters served while their servants sat at table, as in the Chronia celebrated at Athens, in honour of Chronos or Saturn. At the festival of the Peloria, public entertainments were made for strangers and even for slaves, who were served by their masters: and it is said, that the practice, as well as the feast, originated from this circumstance, that Pelorus was the person who first gave intimation to Pelasgus, that by means of an opening in the valley of Tempé the waters of Deucalion's deluge were removed, which intelligence gave that prince so much joy, that he regaled Pelorus in a magnificent manner, and insisted upon serving him at table.

PELORIA, in *Botany*, so named by Linnæus, from *πελορ*, a monster, is a remarkable variety of the common Yellow Toadflax, *Antirrhinum Linaria*, in which the flowers, naturally ringent, with two long and two short stamens, and one simple nectariferous spur, become regularly five-cleft, with five spurs, and five equal stamens. Linnæus published a dissertation on the subject, reprinted in *Am. Acad.* v. 1. 55, with a plate. He gives an interesting history of the first discovery of this flower, by a young student of botany little aware of its curiosity, who gave it to Olaus Celsius; and by the latter it was shewn to Linnæus, who at first thought a trick had been played, by affixing flowers of some other plant to the Toadflax. But when these flowers themselves could not be referred to any thing, his curiosity was strongly awakened. This monster, in short, overthrew not only his own system, but that of every other teacher, if we except the sober *frustrists*; who, no doubt, had they seen such a prodigy, would thence have deduced no small matter of triumph over their adversaries, who contended for the importance of the flower in classification, above other parts; for the pistil and fruit are not affected by the above metamorphosis. How might Linnæus in his turn have exulted, in exhibiting the latter parts changed to a real leaf, in the double-blossomed cherry!—Exultation, however, does not justly belong to those who attempt to measure their own powers with the wisdom of Nature. A little further enquiry discovered other species of *Antirrhinum* subject to the same change; nor are similar instances wanting in different genera of the *Didynamia Angiosperma*, which by this means are transferred to the *Pentandria Monogynia*. Both sorts of flowers are often found on the same plant of *Bignonia radicans*, and have likewise been observed, for many successive seasons, by the writer of this, on the *Antirrhinum* in question, an approach towards which is drawn from the life, in *Engl. Bot.* v. 10. t. 658. The seeds from such altered flowers, nevertheless, do not appear more disposed to pro-

duce the *Peloria* than others. Indeed if all their progeny be not carefully rooted out, the garden will soon be overrun with genuine *A. Linaria*, to the exclusion of the less vigorous plants that bear monstrous flowers, though the latter, if kept clean from weeds, continue in general true to their first metamorphosis, and increase considerably by root.

PELORIDES, in *Natural History*, a name given by some to a peculiar species of chama. Bellonius, who first used the word, never gives it alone as the name of the shell, but only uses it as an epithet derived from *Peloro*, the name of the place where a particular species of chama was very frequent.

PELORUM, in *Ancient Geography*, a river of Asia, in Iberia. Dion Cassius.—Also, a promontory in the N.W. of Sicily, near the cape of Faro.

PELOS, in *Geography*, a town of Italy, in the Cadurin; seven miles N.E. of Cadora.

PELOW, a town of Ava, on the left branch of the river Ava; 15 miles from Prome.

PELT-ROT, in *Agriculture*, a disease in sheep, which is often very destructive. See ROT.

PELT-wool, wool stripped of the skin or pelt of a dead sheep.

PELTA, *πελτα*, in *Antiquity*, a kind of buckler, used among the ancients.

The pelta was small, light, and more manageable than the parma.

It appears from Virgil, and other authors, that the pelta was the buckler used by the Amazons: and Xenophon observes, that the pelta of the Amazons was shaped like a leaf of ivy. Pliny, speaking of the Indian fig-tree, says its leaves are of the width of the Amazonian pelta. Servius on the *Æneid* says, the pelta resembled the moon in her first quarter.

PELTA, in *Botany*, a name happily adopted by Dillenius from the Latin language, (in which it means a short, somewhat crescent-like, shield or buckler,) for the peculiar shields of one tribe of Lichens, first separated as a genus by Hoffmann, under the appellation of *Peltigera*, and now retained by that of *Peltidea*; see that article, and LICHENES.

Pelte, or targets, are almost always situated towards the margin or extremity of the frond, either on the upper or under side, being closely attached to its surface, and each consisting of a flattish, or slightly convex, brown smooth disk; the border being accessory, and hardly distinguishable, originating from the frond.

PELTÆ, in *Ancient Geography*, a town of Asia, in Phrygia. This town was well peopled, and situated at the distance of 10 parasangs from Celenes. Cyrus sojourned here three days, and was a spectator of the Lupercalia which Xenias of Arcadia celebrated by sacrifices and games, at which the prizes were currycombs of gold. This town is not mentioned by Xenophon, Strabo, Ptolemy, and Stephanus of Byzantium.

PELTAN, THEODORE ANTHONY, in *Biography*, a learned Jesuit in the 16th century, was born at Peltis, in the diocese of Liege, whence he derived his surname. He became a member of the Society of Jesus in the year 1552, and acquired celebrity by his proficiency in the Latin, Greek, and Hebrew languages, and his knowledge of philosophy and divinity. When Albert, duke of Bavaria, founded the university of Ingolstadt in 1556, he was appointed professor of Greek and Hebrew literature in that seminary, and discharged the duties of his office with uncommon assiduity and success. He was admitted, at different periods, to the several degrees, and in 1562 he proceeded doctor. Immediately afterwards he was called to the theological chair,

chair, which he filled with great reputation till the year 1574, when he retired to the college belonging to his order at Aufsburg, where he spent his time in laborious study and writing till his death, which took place in the year 1584. He was the author of a work entitled "Theologia Naturalis, et Theologia mystica." He was also author of many other works, chiefly on moral and theological subjects. Moreri.

PELTARIA, in *Botany*, so named by Jacquin, from *pelta*, a shield or target, in allusion to the shape of the seed-vessel. Jacq. Enum. Stirp. Vind. 260. Linn. Gen. 336. Schreb. 439. Willd. Sp. Pl. v. 3. 471. Mart. Mill. Dict. v. 3. Gært. t. 141. (Clypeolæ species; Juss. 240. Lamarck Illustr. t. 560. f. 2.)—Class and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliquosæ*, Linn. *Crucifera*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of four ovate, concave, erect, coloured deciduous leaves. *Cor.* cruciform, of four obovate, entire, flat petals, whose claws are shorter than the calyx. *Stam.* Filaments six, awl-shaped, the two opposite ones shortest, and equal to the calyx; anthers simple. *Pist.* Germen roundish, compressed; style short; stigma simple, obtuse. *Peric.* Pouch roundish, compressed almost flat, entire, of one cell, not bursting. *Seeds* from one to three, roundish, compressed, emarginate.

Eff. Ch. Pouch nearly orbicular, entire, compressed, of one cell, not bursting, with from one to three seeds.

Obf. Jussieu reduces this genus to *Clypeola*, and he is followed by Lamarck; but the only genuine species of the latter, which is *Ionthlasi*, has toothed stamens, like *Alyssum*; and Gærtner observes, that the valves of its pouch are really distinct and separable, which is not the case in *Peltaria*. He therefore retains the latter, for this particular reason more especially. In assenting to this however we can only insist upon the original species. *P. Garcini*, Willd. n. 2, appears by Burmann's figure, Fl. Ind. t. 46. f. 1, to be, as Mr. Brown has suggested to us, probably an *Isatis*. *P. copensis*, Linn. Suppl. 296, has, as Willdenow well observes, a pouch of two cells, with distinct valves and a membranous partition. Its habit is like a *Heliophila*. Whatever it may be, it is no *Peltaria*.

1. *P. alliacea*. Garlic-scented *Peltaria*. Linn. Sp. Pl. 910. Jacq. Austr. t. 123. (Bohadschia; Crantz Stirp. Austr. fasc. 1. 2. t. 1. f. 1. *Clypeola pereunis*; Arduin. Spec. 1. 16. t. 6. *Thlaspi montanum primum*; Clus. Hist. v. 2. 130. *T. pannonicum Clusii*; Ger. Em. 266.)—Native of itony mountainous places in Austria, near the lofty Schneeberg. It was introduced into our gardens in the time of Clusius, as he himself mentions, and is still preserved, for the sake of curiosity, in Botanical collections, flowering in May, and ripening seed a month or six weeks later. The root is perennial. *Plant* like some species of *Thlaspi*, as *perfoliatum* and *alpestre*, but larger. The leaves are ovate, entire, smooth, of a light glaucous hue, clasping the stem with their arrow-shaped base. *Flowers* white, rather small, in several terminal slender-stalked *corymbs*, which at length become racemose. *Pouches* orbicular, but very irregular in their outline, about a quarter of an inch broad, reticulated with prominent veins, the cavity of much less diameter than the whole pouch.—The herb when bruised has an unpleasant garlic scent, somewhat like that of *Erysimum Alliaria*. The seeds are bitter and acrid.

PELTASTES, πελταστες, among the *Ancients*, one who used the buckler called *pelta*.

PELTATUM FOLIUM, in *Botany*, a peltate leaf, is so called from the insertion of the footstalk into some part of its disk, whether towards the centre or near the margin, which mode of attachment is compared to a shield presented

at arm's length. Such is the leaf of the *Tropæolum*, whose insertion is nearly central, and that of *Pelargonium peltatum*, in which it is nearer the base, sometimes, if we mistake not, gradually disappearing, or varying, into the common mode of attachment. See **PELARGONIUM**.

PELTIDEA, in *Botany*, so named by Acharius, from *πέλις*, a target, see **PELTA**, and *εἶδος*, form or shape; a genus of the natural order of **LICHENES**, for whose characters, with mention of some principal species, we refer the reader to that article, n. 18. The genus is divided, in the *Methodus* of Acharius, into four sections.

Section 1. **EMPROSTEA**. *Targets nearly marginal, on the upper surface of the frond.*

This section consists of ten species, of which *venosa*, Engl. Bot. t. 887, and the common *canina*, t. 2299, are examples; and from which is now excluded by its author the *chlorophylla*, n. 7, as being a variety of *Cetraria sepincola*. To this point we cannot speak; but *collina*, Engl. Bot. t. 1834, is now admitted by Dr. Acharius, as possibly distinct from *rufescens*, t. 2300, so that the number of species in this division remains unaltered.

Section 2. **OPISTERIA**. *Targets nearly marginal, at the back of the frond.* Two, which Acharius considered as certain species, form this section; *polaris*, (Jacq. Misc. v. 2. t. 10. f. 1.) and *resupinata*, Engl. Bot. t. 305. To these are subjoined as doubtful, what we can aver to be no less certain and distinct than the others, *parilis*, Engl. Bot. t. 2360, and *cellulosa*, a curious species brought by Mr. Menzies from the straits of Magellan.

Section 3. **PLEUROTHEA**. *Targets lateral, scattered over the upper surface of the frond.* The beautiful *crocea*, Engl. Bot. t. 498, is the only example.

Section 4. **PEROPHORA**. *Targets lateral, sunk into hollows in the upper surface.* The only certain species is *saccata*, *ibid.* t. 288. Two doubtful ones, unknown to us, are *esculenta* and *velleiformis*; the former described in Pallas's Travels, t. 1. f. 4: the latter by Bellardi, in his Appendix to the Flora Pedemontana.—The plants of these two sections are now referred by Acharius to his genus *Arthonia*, a measure from which we have already, under the article above referred to, presumed to express our dissent.

PELTUINUM, in *Ancient Geography*, a town of Italy, in the territory of Samnium.

PELUA, a town of Illyria, on the route from Sirmium to Salonæ, between Salva and Æquum, according to the Itinerary of Antonine.

PELVIS, in *Anatomy*, is a large irregular bony cavity, open above and below, and forming the inferior end of the trunk. At the upper and back part its parietes support the vertebral column, and they are sustained below and towards the front by the thighs, to which they transmit the weight of the body; thus a well-marked space, which measures the immediate base of support of the trunk, is left between the plane of the limbs and of the spine. In a well-formed individual the pelvis divides the body into two equal halves: that is, if a line be drawn across its middle, the upper and lower portions of the body have the same length. This rule, however, is subject to some exceptions: the lower limbs are imperfectly developed in the fœtus; and, in unusually tall or short adult individuals, the lower extremities or the trunk exceed the just proportion.

The pelvis is symmetrical, but of a figure not easily defined. It forms, by its upper portion, a cavity nearly oval in the transverse direction, expanded at the sides, and hollowed out in front, communicating by an elliptic opening, called the superior aperture (*détroit supérieur*), with its lower portion, which is much smaller in size, and ends below

PELVIS.

low by an opening called the inferior aperture (*détroit inférieur*).

Lines drawn from one side of the pelvis to the other are horizontal, because, on account of the symmetry, the parts on the two sides are exactly on the same level.

The position of the pelvis is oblique, the back part being considerably higher than the front: this obliquity is well seen in the superior aperture, which slants very manifestly from above downwards and forwards: the inferior aperture looks downwards and backwards. Soemmerring states, that in the erect attitude, the last bone of the coccyx is an inch higher than the inferior edge of the symphysis pubis; and that the promontory of the sacrum is higher than the same point, by the whole depth of the sacrum and coccyx. (*Orteologia*, § 432.) The symphysis pubis is oblique, from before backwards and downwards; and the upper part of the sacrum slants in the same direction. The axis of the upper or broad part of the pelvis (the *greater pelvis*) is nearly perpendicular: that of the lower or smaller division (the *lesser pelvis*) slants from above downwards, and from before backwards. It is said to correspond to a line drawn from the apex of the os coccygis to the umbilicus. This line would cut the level of the pelvis nearly at a right angle: that is, the meeting of the two lines would form an angle of 75 degrees in front, and of 105 behind. The weight of the trunk being obliquely transmitted to the thighs, in consequence of this inclination of the pelvis, it follows, says Bichat, that the latter is the seat of a decomposition of motion in this transmission, proportioned to the degree of inclination, which is about thirty-five or forty degrees at the upper part, where we can easily estimate it by the line, which extends from the sacro-vertebral articulation to the upper edge of the symphysis pubis.

The capacity of the pelvis differs remarkably in man and woman. It is manifestly larger in the latter in every direction: thus the two iliac crura, the two anterior, and the two posterior spines, the cotyloid cavities, the tuberosities of the ischia, &c. &c. are further apart. These are all transverse measurements, and those from before backwards are greater, as we may see in measuring from the sacrum to the pubes, from the anterior to the posterior spine, from the sacro-iliac articulation to the foramen ovale, &c. The oblique measurements, from one side to the other, are also larger in the female. The superior aperture often exhibits deviations from the accustomed arrangement, in the diminution of its diameters subsequently to birth; and these are generally caused by rachitis, which exerts its effects more on the antero-posterior, than on the transverse or oblique diameters, because the weight of the upper parts, transmitted by the spine, is the principal exciting circumstance.

The breadth of the pelvis in the female produces some difficulties in progression; but the passage of the child in parturition is facilitated. It performs an important part in this function, besides having the same offices as in man, *viz.* those of forming the basis of support to the trunk, and of containing and protecting the viscera.

The comparative height of the pelvis in the male and female is exactly the inverse of the breadth. The measurement from the crista of the ilium to the tuberosity of the ischium, the depth of the symphysis pubis, and the length of the canal formed by the smaller pelvis, are considerably greater in men than in women.

There are some individual varieties in the dimensions of the pelvis, but they depend very little on stature. Parturition is as easy in small as in large women, although the former frequently produce very large children.

The pelvis is formed of few but very broad bones, united

in such a manner, as not to admit of motion on each other: it can be moved therefore only altogether, and not partially. Four bones enter into its composition; two posterior, symmetrical, and placed on the middle line, are the sacrum and coccyx; two anterior and irregular, transmit to the thigh bones the weight of the trunk, which they have received from the sacrum; they are the *ossa innominata*. The sacrum and coccyx, placed at the back of the pelvis, form a continuation of the vertebræ, and are constructed in a mode similar to that of the vertebræ. In most quadrupeds this prolongation of the spine is much more extensive, and forms the tail, which goes considerably beyond the anus, while in man, that opening is situated a little farther than the end of the coccyx. The sacrum and coccyx are described under the article *SPINE*; the *ossa innominata* under *EXTREMITIES*.

Articulations of the Pelvis.—The relations of the vertebral column to the pelvis are maintained by the articulation of the last vertebra to the sacrum, and to the *os innominatum*. The coccyx is articulated to the sacrum. The two *ossa innominata* are joined to the sides of the sacrum, and to each other in front.

1. *Sacro-vertebral Articulation.*—It is formed by two articular surfaces, belonging to the lumbar vertebra and the sacrum, and resembling, in every respect, those by which the vertebræ correspond to each other. The uniting media are also the same with those described in the account of the vertebral column; *viz.* anterior and posterior vertebral ligaments, which are prolonged to the sacrum, a fibro-cartilage between the latter and the body of the vertebra, a yellow ligament between the laminae of the latter and the back of the orifice of the sacral canal, an interspinal ligament uniting the middle ridge of the sacrum to the spinous process of the vertebra; and the supra-spinal ligament, which ends here upon the sacrum. The disposition and structure of all these, as well as of the synovial membranes belonging to the articular processes, are exactly the same as those of the corresponding parts in the spine. (*See SPINE.*) This articulation has however one ligament peculiar to itself, extending from the lower and anterior part of the transverse process of the vertebra, obliquely outwards and downwards to the sacrum, decussating the anterior fibres of the sacro-iliac articulation. It is short and strong, covered by the psoas in front, by cellular tissue and ligaments behind.

2. *Sacro-coccygeal Articulation.*—This is analogous to the joints of the spine: it is formed by two oval surfaces of the sacrum and coccyx, strengthened by a fibro-cartilage, and by an anterior and posterior fibrous band.

The fibro-cartilage is analogous to those of the spine, but much thinner, and allows much freer motion of the connected parts. The three smaller pieces are connected to each other and to the first piece by fibro-cartilages analogous to this. The little tendency of these fibro-cartilages to ossification explains why the four pieces of the coccyx remain so long separate.

The anterior ligament is very thin, and often scarcely perceptible. It consists of some parallel fibres, varying in length continued from the pelvic surface of the sacrum to that of the coccyx. Sometimes there are two more strongly marked lateral fasciculi.

The posterior is a much more considerable ligament, and, besides strengthening the articulation, has the office of completing behind the end of the vertebral canal. It is fixed above to the edges of the excavation, which terminates the canal, and descends perpendicularly to the spinal surface of the coccyx, on which it is expanded. It is covered by the skin behind, and has a few fibres of the *gluteus magnus* adhering to it. In front it corresponds, first, to the end of the

PELVIS.

the sacral canal, then to the surface of the sacrum within the excavation at the end of the canal, and lastly to the coccyx.

3. Connection of the last lumbar vertebra to the os innominatum: (*vertebro-iliac articulation*).

A ligament, called ilio-lumbar (*lig. pelvis anticum superius et inferius*) is the medium of connection. It is fixed to the point of the transverse process of the last vertebra, and sometimes of the fourth also, goes horizontally outwards, and is fixed to the posterior and superior spine, and to the crista of the os innominatum.

Its fibres are often divided into several fasciculi, separated by cellular tissue, of which the superior are longer than the inferior ones. It is a strong ligament, covered in front by the psoas, behind by the vertebral muscles, corresponding above to the quadratus lumborum, and below to the sacro-iliac ligaments.

4. *Sacro-iliac articulation*,—sacro-iliac symphysis, or posterior symphysis of the pelvis.

The broad and irregular opposed surfaces of the sacrum and os innominatum are covered by a crust of cartilage, which has been generally represented as single, and common to the two bones. Bichat considers that each surface has its own covering, and that the investment of the sacrum is rather the thickest. When the bones are torn asunder, the two surfaces are rough; and Bichat describes a soft yellowish substance between them, which he regards as analogous to synovia. In the child this is white and really fluid, and the cartilaginous surfaces are much smoother and more distinct. The bones are tied together by the following ligaments.

The posterior or great sciatic ligament (*ligamentum tuberoso-sacrum*) is thin, flattened, nearly triangular, and situated at the lower and back part of the pelvis. It arises from the end of the crista ilii, and from the sides and back part of the sacrum and coccyx, being at first very broad; it becomes narrower and thicker, and passes obliquely outwards and downwards to the tuberosity of the ischium; in which it is inserted, growing again a little broader. A little prolongation runs beyond the tuberosity, and is fixed to the edge of the bone in front. This ligament is composed of fibres more oblique in their direction in proportion as they are higher, converging from the sacrum to the os innominatum, and often separated by intervals occupied by a fatty cellular substance and vessels. It is covered behind by the *gluteus magnus*, of which the fibres are inserted in it. In front it corresponds, on the inside, to the lesser sacro-sciatic ligament, to which it is united; on the outside to a triangular aperture separating it from that ligament, and traversed by the *obturator internus*, and the pudic vessels and nerve.

The anterior or small sacro-sciatic ligament (*lig. spinoso-sacrum*) is placed in front of the former, and resembles it in form, but is less oblique. Its attachments to the sides of the sacrum and of the coccyx are confounded with those of the former. Thence it passes outwards and forwards, becoming narrower and thicker, and is fixed to the apex of the spinous process of the ischium. Its fibres are more nearly transverse in proportion as they are higher, separate into distinct fasciculi, and leaving cellular and vascular intervals between them. It corresponds behind to the former ligament, and to the pudic vessels and nerve. In front it contributes, as well as the posterior ligament, to complete the sides of the pelvis, of which the bony parietes are here interrupted. Its fibres are mixed with those of the *coccygeus* muscle.

A very strong flattened perpendicular ligament (*ligamentum posticum ossis coxæ*, *lig. sacro-épineux*) passes from the posterior and superior spine of the os innominatum to the lateral and back part of the sacrum. The

superficial fibres are the longest, and they become shorter as they are more deeply seated. It is a very strong compact ligament, and holds the two bones together nearly motionless in the natural state. A fasciculus, situated more deeply than the former, (*lig. posticum breve*), goes obliquely from the posterior inferior spine to the sacrum, and rather decussates with the former, to which it is much inferior in length and strength.

The *sacro-iliac ligament* is a large assemblage of dense, short, and close fibres, occupying the irregular space left between the sacrum and os innominatum, behind their articular surfaces. It passes transversely from one bone to the other, and is attached to the rough unequal part behind the point of contact of the two bones. Its form is irregular, like that of the space which it occupies. The posterior fibres are the longest, whitest, and most distinct, and form a particular layer: in front they are shorter, in proportion as they are nearer to the articulation. Their resistance is so considerable, either in consequence of their number or shortness, that, when the sacrum is forcibly detached from the os innominatum, the ligamentous fibres are not torn, but detached from one or the other bone, leaving the surface bare.

Besides the two ligaments just described, several fibres of different length and direction pass over the sacro-iliac symphysis, from one side to the other, on its upper and anterior parts. They strengthen the joint, but do not require a particular description.

5. *Symphysis Pubis*.—Before we describe it, we shall notice a ligament, not belonging to it, but requiring, from its situation, to be considered in this place.

The *obturator* ligament occupies the foramen ovale, which it shuts up almost entirely. It is a thin plate, fixed to the circumference of the foramen, except at the upper part, where a groove is left, completing the channel through which the obturator vessels and nerve pass. Its fibres are interwoven in every direction, and form in many parts prominent fasciculi, which are particularly distinct near the groove. It corresponds, by its two surfaces, to the two obturator muscles, which are inserted in it.

The ossa innominata are joined in front by two opposed oval surfaces. Numerous fibres pass from one to the other: they are transverse, and more dense and close in the male than in the female. They may be seen by tearing the bones apart from behind, when they are ruptured in the middle, and not detached from the surfaces, as in the sacro-iliac symphysis. They form concentric laminæ, which decussate, and the most superficial of which extend round the joint, while the others occupy only the upper or lower portion. In some subjects the fibrous laminæ arise from the whole breadth of the articular surfaces; but in most, particularly in women, those surfaces present behind two small cartilaginous incrustations, contiguous to each other, moistened by a whitish or yellowish fluid, but not furnished with a distinct synovial membrane. Sometimes these cartilaginous incrustations occupy nearly the whole breadth of the surfaces in women, and then the fibres are in smaller quantity. The latter and the cartilaginous incrustations are in an inverse ratio to each other, and the proportions are very variable. According to these varieties the bones are more or less strongly tied together.

This and the sacro-iliac symphysis form a kind of connection intermediate between the moveable and immovable articulations.

The following ligaments strengthen this articulation.

A thick and distinct fasciculus of triangular shape (*lig. fous-pubien*) occupies the upper part of the arch of the pubes,

PELVIS.

pubes, which it completes, being fixed to the oblique ramus of each bone at its upper and internal part. Its fibres are long below, and correspond to the cellular tissue about the urethra: they are shorter above, and continuous with the interarticular fibres.

The anterior ligament is not so distinct as the last. It is decussated and covered in front by the aponeurosis of the abdominal muscles, under which it forms several strata. The most superficial consists of oblique fibres, which arise at the upper part of the articulation, separate from each other as they descend, and form two fasciculi, which are lost on the front of the two branches of the arch. The others have an oblique or transverse direction, are much stronger, and go from one bone to the other, confused below with the interarticular laminae.

The articulation is surmounted above by various fibres, which strengthen it: the interarticular laminae project behind towards the pelvis, and this prominence, which is most considerable in the female, marks the middle of the junction.

General Description of the Pelvis.—The pelvis, taken altogether, is a cavity of conical form, of which the basis is turned upwards, and the apex downwards. We have to consider in it the external and internal surfaces, and the superior and inferior circumferences.

The *external surface* comprehends four regions: an anterior or pubic, a posterior or sacral, and two lateral or iliac.

The anterior is the least extensive, and exhibits, 1st, on the median line, the symphysis pubis, which is longer in men than in women, and covered by ligamentous fibres; 2dly, on each side, and from within outwards, the quadrilateral surface, to which the adductors are fixed, the foramen ovale, and the cotyloid cavity.

The posterior region, longer but sensibly narrower than the preceding, offers, 1st, on the middle line, the series of sacral spinous processes, or the continued ridge, which supplies their place; the triangular excavation, which terminates the sacral canal; a furrow indicating the union of the sacrum and coccyx; and the spinal surface of the latter. 2dly. On each side, and from within outwards, the sacral channels, and their foramina; a deep depression corresponding to the sacro-iliac symphysis, which is covered by a thick layer of ligamentous fibres; and the posterior prominent tuberosity of the os innominatum.

The lateral regions are formed by the broad external surfaces of the ossa innominata, bounded below by the ischiatic notches.

The *internal surface* is manifestly divided into two portions: a superior broader one, or the great pelvis; an inferior, which is narrower, and forms a kind of canal, called the smaller pelvis, or simply the pelvis.

The great pelvis presents, behind, the sacro-vertebral articulation; and on the sides the internal iliac fossae. The superior portions of the ossa innominata are expanded horizontally, and sustain the principal weight of the abdominal contents. This arrangement is connected with the erect attitude of the human subject. For a further explanation of the differences between the pelvis of man and animals, see the article MAN. The bony parietes are not continued towards the front, where there is a large excavation, filled by the abdominal muscles.

The superior aperture of the pelvis is the more or less prominent line, beginning from the sides of the sacrum, extending obliquely downwards and forwards along the middle of the os innominatum, where it is called linea ilio-pectinea, to the upper and front part of the pubes, and forming the

communication between the great and the small pelvis. It describes an oval, with the long axis placed laterally, and is much more strongly marked in front than behind.

The small pelvis, much narrower, but longer than the great, forms a kind of canal, wider in the middle than at the ends, and filled by the bladder and rectum in man; and by the same parts, with the addition of the uterus and vagina in women. We observe, in front of it, two surfaces corresponding to the bladder, separated by the symphysis pubis, and bounded by the thyroid foramina; behind, the concavity of the sacrum, with its foramina, terminated by the lines which mark the sacro-iliac symphyses; on the sides, the sciatic notch completed by the ligaments of the same name, and the quadrilateral surface, which separates the notch from the foramen ovale.

The *superior circumference* forms a very irregular line, slightly inclined forwards, and very much expanded in the female. It presents, behind, the sacro-vertebral articulation, bounded on each side by a marked depression, in which we observe the trace of the sacro-iliac symphysis; in front, the large excavations already noticed, formed by the anterior portions of the upper edges of the ossa innominata; on the sides the two iliac crista.

The *inferior circumference*, called also the inferior aperture, is directed downwards and backwards, and is remarkable for three eminences separated by three notches. The two anterior prominences are the tuberosities of the ischia: the posterior and middle one is formed by the coccyx, which does not descend so far as the tuberosities; so that, in the sitting attitude, the latter alone support the weight of the body. The notches have an arrangement exactly inverse of that of the prominences: two are posterior, and one anterior. The latter is called the arch of the pubes. The oblique and oblong portion, which bounds the foramen ovale in front, contributes on each side to its formation. It is terminated above by an angle, nearly acute in man, rounded in women, occupied almost entirely by the generative organs and urethra in both sexes. The posterior notches lie between the sacrum and the tuberosities of the ischia. The sacro-sciatic ligaments divide each into three portions: the superior is a large hole, through which the pyramidalis muscle, the sciatic nerve, and the gluteal, sciatic, and pudendal vessels pass. The second is a less extensive hole than the former, giving passage to the obturator internus, and the pudendal vessels. The third is the general opening, placed in front of the coccyx, and between the sacro-sciatic ligaments, in which the termination of the rectum is placed, surrounded by much cellular tissue.

We have stated already, in general terms, that there are great differences between the male and female pelvis; that the latter is wider in all its dimensions, and deeper from before backwards, while the former measures the most in the perpendicular direction. Hence the cavity of the pelvis is more capacious, and fitted to receive the uterus and vagina, in addition to the parts which it contains in the male, and to give passage to the child in parturition. The distinctions of the two sexes, in this respect, are to be traced through all parts of the pelvis. The ilia are more horizontally expanded, the sacrum more convex, the arch of the pubes much wider and more rounded above in the female than in the male. The superior aperture in the latter has a contracted triangular figure, with the basis turned backwards, and the apex forwards: the inferior aperture is remarkably small, when compared to that of the female. In consequence of this great width of the pelvis in women, that is the broadest part of their trunk, while in man the shoulders are the broadest, and the pelvis the narrowest.

PELVIS.

The following is a comparative view of the dimensions of the male and female pelvis, taken from Soemmerring's Osteology, § 446. The measure is probably Rhyland, of which the foot is to the English as 1033 to 1000.

	In the Male.	In the Female.
The distance between the superior spines of the ossa innominata	9 in. 0 l.	11 in. 0 l.
The superior aperture between the ossa innominata	4 6	5 6
The smaller or conjugate diameter of the same aperture, that is, from sacrum to pubes	4 to 5 in.	4 8
The oblique diameters, from the sacro-iliac symphysis to the pubes	4 in. 2 l.	5 0
Between the tuberosities of the ischia	3 2	4 0
From the apex of the coccyx to the pubes	3 0	4 6
From the tuberosity of the ischium to the superior aperture	4 10	3 6
The depth of the symphysis pubis	1 10	1 6
From the margin of the sacrum to the apex of the coccyx	4 10	5 0
Angle of union of the ossa pubis	60° to 80°	90°

Progressive Development of the Pelvis.—The fœtus, the adult, and the old subject, present essential differences in this part.

In the fœtus it is small in proportion to the rest of the body; it follows, in its growth, nearly the same laws as the lower limbs. This disproportion contributes to the marked prominence which the abdomen of the fœtus presents. The smallness of the pelvic cavity leaves no room for the intestines in that part; even the urinary bladder is in the abdomen, which is moreover dilated in consequence of the great bulk of the liver. The size of the abdomen, which is very considerable from the causes above-mentioned, becomes more striking in consequence of the pelvis being so very small.

The upper part, or great pelvis, which belongs to the abdomen, is more developed than the lower, which contains the generative organs, and affords the point of support to the lower limbs. The iliac fossæ are not so much expanded horizontally, nor so deep. All the dimensions of the pelvis are very small at this time; but the transverse measurements are particularly contracted. The direction of the cavity is more inclined.

The middle of the sacrum, which is concerned in forming the vertebral canal, is already much advanced, but the lateral portions are more backwards; since the foramina are proportionally nearer to the sacro-iliac symphyses. The posterior prominences hardly exist. The pieces corresponding to the bodies of the vertebræ, like those bodies, are rounded and imperfect in front, more developed behind, where they form the canal. The coccyx is small, and contains only osseous rudiments.

The three portions composing the ossa innominata are developed towards their middle; but the circumference, and all the prominences, are cartilaginous. The cotyloid cavities are almost entirely in this state, and not capable of affording

to the thighs a degree of resistance sufficient for the purpose, of standing and walking.

As age advances, the pelvis is more developed to fulfil the important functions, which it has to execute in locomotion and standing, as well as in regard to the generative functions. It becomes less inclined in its position, and gradually acquires those proportions and dimensions which we have already indicated in the general description. Its development is earlier in the female than in the male, so that in many individuals the cavity is so far formed as to answer the purposes of parturition at the age of nine or ten years. The pieces which compose the sacrum and os innominatum, are consolidated about the age of puberty. The cartilage between the rami of the pubes and ischium disappears sooner. The cristæ, and the tuberosities of the ossa innominata, remain to a later period, and the former are the last in their completion.

The pelvis experiences very little change in old persons; its bones are very seldom ankylosed, except the sacro-coccygeal articulation. Their unions, however, are more dense and solid. The general direction of the cavity is altered, the obliquity being lessened.

Mechanism of the Pelvis.—We must consider it as it is concerned in four principal functions; 1st, as the support of the trunk in standing and sitting; 2dly, as the point on which the thighs are moved; 3dly, as executing itself various motions; and 4thly, as forming a large cavity, lodging various important viscera.

In standing, the pelvis is placed between two opposite forces; viz. the weight of the body transmitted to it by the vertebral column, and the resistance opposed by the thighs; hence it would be carried backwards on the thighs, if the powerful muscles extending from the latter to the front of the vertebral column, did not maintain it in the horizontal position. The basis of support of the trunk then occupies the space included between the line of the spine, and of the hips. This space is narrower in the fœtus and child, because the greater obliquity of the pelvis brings the thighs nearer to the line of the sacrum; hence standing is more difficult, and becomes easier in proportion as the elevation of the pubes widens the base of support. The figure of the sacrum, which is received like a wedge between the ossa innominata, is well calculated for the office which it serves, of transmitting to the latter the weight of the trunk, and for preventing it from being depressed between them.

The pelvis rests on the tuberosities of the ischia in the sitting attitude; so that the basis of support is rather enlarged towards the front, the line of these tuberosities being rather anterior to that of the cotyloid cavities. The horizontal extension of the lower limbs, either in whole or in part, according as we sit on the ground, or on a more elevated seat, is another circumstance contributing very greatly to extend the basis of support towards the front, in the sitting attitude.

In considering the pelvis as the point on which the lower limbs are moved, its mechanism belongs particularly to progression. The separation of the two cotyloid cavities produces an analogous separation of the thighs, and thus increases the extent of their motions. The pubes may be regarded in the lower extremity as having the same use with the clavicle in the upper; with this difference, that the latter is moveable, and accompanies all the motions of the humerus, while the former is fixed. The interval between the acetabula is more considerable in the female, because all the transverse measurements of the pelvis are greater. Hence the progression of females has in it something peculiar, arising

from the greater portion of a circle which the pelvis has to describe at each step. In the child, where the thigh bones are nearer together, the motions are easier but less secure. At this time the thigh-bones are equally approximated in both sexes. The pelvis of the male and female hardly differ in the fœtus; the distinctive characters are produced at a subsequent age.

The pelvis may be moved on the spine, or on one or both thighs. It cannot be moved on the vertebral column without the whole body being prostrate; in that attitude it may be bent, extended, or inclined laterally. These motions do not take place entirely in the sacro-vertebral articulation, but in the whole of the joints of the lumbar vertebræ; as the more extensive motions of the head are effected by a general movement in the whole neck.

Flexion of the pelvis upon the two thighs is not so easily performed, as might at first be supposed. For, if the trunk is much inclined forwards, the centre of gravity is no longer sustained, and the body very quickly falls. The trunk has two points of support; the cotyloid cavities above, and the feet below, the first of which is on a line posterior to that of the second. Hence, when the trunk is bent, the pelvis remaining immovable, the centre of gravity must pass beyond both in succession, before a fall can occur. But, if the pelvis is moved with the trunk, the centre of gravity has a single base of support, and soon goes beyond it; consequently the pelvis in general partakes but little in these motions; yet it is sometimes concerned, and then the hip-joints are the centres of motion. In the latter case, the legs, thighs, and pelvis, are carried backwards, so that the lower limbs describe an oblique line, the upper part being thrown much farther back than the lower. This inclination visibly enlarges the basis of support, which would have been too narrow, formed by the feet alone.

Extension of the pelvis on the thighs is not more marked than flexion; indeed the ligamentous fibres on the front of the joint prevent the thigh-bone from being carried backwards on the pelvis beyond a straight line, and must equally prevent the corresponding motion of the pelvis on the thigh. In inclinations of the trunk backwards, the loins are the seat of motion, and not the hip-joints; when we extend this motion as far as possible, the pelvis and thigh are both inclined. When the trunk is carried in this direction, the knees are bent forwards, so as to give the legs an oblique direction, calculated to support the line of gravity of the trunk, because there is no basis of support behind, analogous to what the feet offer in front. If we incline the trunk backwards in any sensible degree, the lower limbs remaining straight, a fall is inevitable.

Lateral inclination on the two thighs can hardly be said to take place; in fact it cannot be depressed on one side, without being raised on the other; and as the two limbs rest at the same time on the ground, this motion cannot take place.

The motions of the pelvis on one limb are quite different from those which it performs on the two. It can be moved with facility in every direction; lateral inclination and rotation are easily executed. The latter movement is seen in the pirouettes of dancers. It is very partial, the structure of the hip being such that the pelvis can describe only a small portion of a circle on the thigh.

The particular bones of the pelvis have scarcely any motion in the natural state, excepting the coccyx, which can be moved forwards and backwards.

The ossa innominata are entirely incapable of motion at both their articulations; yet, if the symphysis pubis be cut,

there is a degree of mobility in the sacro-iliac joint. At the time of pregnancy, or after several utero-gestations, there is a relaxation of these connections, allowing a visible motion between the two ossa innominata at the pubes. This phenomenon however is not constant.

The organs contained in the cavity of the pelvis are excellently protected from all external shocks. The kind of arch formed by the ossa pubis in front, the thick muscles, the hip-joints, and the trochanter at the sides, and the muscular masses of the spine behind, constitute an effectual provision for the resistance of injury. The projection of the ossa innominata beyond the sacrum behind, protects the latter bone in cases of blows or falls on this part of the pelvis.

PELVIS of Birds. See *Anatomy of BIRDS.*

PELVUS, in *Ancient Geography*, the name of an island, situated in the vicinity of that of Chios.—Also, a mountain of Italy, in Etruria.—Also, a torrent of Sicily.

PELVUS, in *Geography*, a town of Persia, in the province of Mecran; 54 miles N.N.E. of Kich.

PELVUS Armena, in the *Materia Medica*, a name given by some of the old writers to the drug that we at present call bole armoniac. This was the original name, and the term *bolus armena* is not to be found, but in the later writers.

PELVSIUM, in *Ancient Geography*, a town of Egypt, at the eastern extremity of the lake Menzale, near one of the mouths of the Nile, and, according to Strabo, about two miles from the sea. Its name, which in Greek signifies *mud*, proves its situation to be in the midst of lakes and marshes; as does also the Hebrew term *Sin*, by which the prophet Ezekiel denominates it; and also the *Thinab* of the Arabians. The period of its foundation, as well as that of the other ancient cities of Egypt, is lost in the obscurity of time. It flourished long before Herodotus. As it commanded the entrance of the country on the side of Asia, the Pharaohs rendered it a considerable fortress: one of them raised a rampart 30 leagues in length, from the walls of this town to Heliopolis. This rampart, which covered Pelusium, did not, however, stop Cambyfes, who attacked it with a formidable army. Cambyfes, after a bloody battle, in which he slaughtered his enemies, entered Pelusium in triumph. Herodotus, who visited Pelusium some years after the conquest of Cambyfes, says that he surveyed the plain where the two armies had fought, and found it covered with human bones collected in heaps; those of the Persians on one side, and those of the Egyptians on the other. Pelusium, after passing under the dominion of Persia, was taken by Alexander. The brave Antony, general of cavalry under Gabinus, took it from his successors; and Rome restored it to Ptolemy Auletes. Pompey, after the fatal battle of Pharsalia, took refuge at Pelusium; but he had scarcely landed on the shore, when Theodore, the rhetorician of the isle of Chio, Septimius the courtier, and Achilles the eunuch, who commanded his troops, wishing for a victim to present to his conqueror, stabbed him with their swords. At the sight of the assassins, Pompey covered his face with a mantle, and died like a Roman. They cut off his head, and embalmed it, to offer it to Cæsar, and left his body naked on the shore.

Pelusium was often taken and pillaged, during the wars of the Romans, the Greeks, and the Arabs; but in spite of her disasters, she preserved, to the time of the crusades, her riches and her commerce. The Christian princes, having taken it by storm, sacked it. It never again rose from its ruins, and the inhabitants went to Damietta. Farama, founded by the Arabs, a little to the eastward of Pelusium, took place of it. See *FARAMA*.

Pelusium

Pelufium gave name to the *Pelufian* branch of the Nile, but nothing now remains of it but ruins. This canal has now no communication with lake Menzale, except that which is merely temporary, on the swelling of the Nile; but at other times it is dry.

PELUSIUM, a port of Theffaly. Steph. Byz.

PELUSO, in *Geography*, a small island in the Mediterranean, near the coast of Natolia. N. lat. $36^{\circ} 45'$. E. long. $28^{\circ} 56'$.

PELUSSIN, or PELLUSIN, a town of France, in the department of the Loire, and chief place of a canton, in the district of St. Etienne; 12 miles E. of it. The place contains 3290, and the canton 11,716 inhabitants, on a territory of 140 kilometres, in 13 communes.

PEMAQUID, a bay of America, on the sea-coast of Lincoln county, in the State of Maine. It lies east of Sheepscot river, and contains a number of islands, many of which are under cultivation. N. lat. $43^{\circ} 45'$. W. long. $69^{\circ} 30'$.

PEMAQUID Point, a cape on the west side of the above bay, two miles E. of Booth bay, and about four leagues N.W. of Menhagan island. N. lat. $44^{\circ} 5'$. W. long. 69° .

PEMAR, a town of Sweden, in the province of Finland; 12 miles E. of Abo.

PEMARO, a town of Etruria; 15 miles E.S.E. of Leghorn.

PEMBA, or PENDA, an island in the Indian sea, near the coast of Africa, about 100 miles in circuit, and governed by a king, who is tributary to the Portuguese. S. lat. $5^{\circ} 55'$. E. long. 42° .

PEMBA, a province of Congo, bounded on the north by the province of Sundi, on the east by Batta, on the south by Bamba, and on the west by Songo. It is divided into the province of St. Salvador, and the marquise of Bamba, from its chief towns. It is generally fertile, more especially towards the east.—Also, a town of Congo, and capital of a marquise; 75 miles S. of St. Salvador. S. lat. $7^{\circ} 30'$. E. long. $12^{\circ} 52'$.—Also, a bay of the Indian sea, on the coast of Africa. S. lat. 13° .

PEMBRIDGE POINT, a cape on the east coast of the Isle of Wight. N. lat. $50^{\circ} 42'$. W. long. $1^{\circ} 56'$.

PEMBROKE, or PEMBROCH, a borough and market-town in the hundred of Castle-Martyn, and county of Pembroke, South Wales, is situated on a singular neck of land, dividing the small estuary of Down-Pool, which flows from Milford haven. It is the county town, and, next to Caermarthen, is one of the largest and richest towns in the southern division of the principality. The period of its foundation is unknown, but it is certainly of great antiquity, and is supposed to have derived its name from the British word *Penfro*, signifying a cape, or promontory. It was anciently fortified, and protected by a most magnificent castle, the vast ruins of which still give it an appearance of uncommon grandeur; and was likewise defended by a strong wall, still nearly entire, on the northern side, where it is flanked by numerous bastions of great thickness and strength. Through this wall were formerly three gates, on the east, north, and west sides; besides a small postern on the south side, leading to the marsh. Of these gates, that facing the north is the only one now standing; the other two having been long since destroyed. The east gate, which remained in Leland's time, is described by him as consisting of solid iron, and as being highly ornamented and fortified.

The corporation of Pembroke is composed of a mayor and council, two bailiffs and serjeants at mace, and about 1500 burgeses. The mayor holds a court every fort-

night, for the decision of civil causes arising within his jurisdiction. Here are also held the petty sessions for the hundred of Castle-Martyn. The markets are on Wednesday and Saturday; and the fairs on the 14th of May, Trinity Monday, St. Peter's day, old style, and 25th of September. Pembroke, in conjunction with the neighbouring boroughs of Tenby and Wilton, send one member to the British parliament: the mayor is the returning officer. The voters are estimated at 500 in number, and are chiefly in the interest of the Owen family.

According to the population returns of 1811, this town contains 501 houses, and 2415 inhabitants. The houses are ranged principally in one long street, which extends from east to west along the ridge of a hill, and is terminated by the castle at the west end; bearing in general appearance, but on a smaller scale, a strong resemblance to the towns of Edinburgh and Stirling, in Scotland. The public buildings are a town-hall, a free grammar-school, and two parochial churches, dedicated to St. Mary and St. Michael. St. Mary's church stands near the centre of the town, and consists of a nave, chancel, and north aisle, with a small chapel to the south. St. Michael's bears evident marks of great antiquity. The architecture is a rude specimen of the Norman style, the arches being massive, and rounded, and entirely destitute of ornament. Both these churches are consolidated with that of Monckton in one vicarage, the impropriation and presentation of which belong to viscount Hereford, as proprietor of Monckton priory, and its estates. Attached to St. Michael's was a chapel, or hospitiun, dedicated to St. Mary Magdalen, the ruins of which are now known by the name of the Marlan's chapel. St. Mary's had likewise its chapel, called St Anne's; but this edifice is now entirely demolished.

The castle, as already mentioned, forms the western extremity of the town, occupying a rocky termination of the ridge on which it is placed. It is a noble ruin, and exhibits, in certain points of view, one of the finest subjects for the pencil which Wales can boast of. This fortress, according to Caradoc of Llancarvon, was founded in 1092, by Arnulph de Montgomery, son to the earl of Shrewsbury, on the site of a more ancient British work. It seems, however, to have received great additions in the reign of Henry I., and Giraldus even refers its foundation to that period; though he acknowledges the existence of another much more slender erection of anterior date. During the wars with the Welsh it was frequently besieged, but owing to its great artificial strength, and almost impregnable natural position, it seems to have resisted successfully all the efforts of the assailants to reduce it. Oliver Cromwell also besieged it in person, in the time of the grand rebellion, and compelled its garrison to surrender, after a long and vigorous attack.

From the period of its surrender, Pembroke castle has been much neglected, and is now so ruinous as to be uninhabitable. It is divided into two parts, called the inner and outer wards; the former of which comprises the keep and the state apartments; and the latter, the buildings formerly appropriated to the garrison; though over the principal gateway from the town, and within it, there were also some very handsome apartments. Here, according to Leland, was "the chambre where king Henri VII. was born, in knowledge whereof a chymney is new made, with the arms and badges of king Henri VII." This honour, however, is traditionally given to a room in a very splendid suite of apartments built over "the marvellous vault, entitled the Hogan," which is cut out of the solid limestone rock, and forms one of the most extensive and lofty excavations of its

kind in Great Britain. Its figure approaches that of a circle, the diameter from north and south being 76 feet 8 inches, and from east to west 57 feet 4 inches. The natural opening, which was of great width, is built up, and contracted into a small door-way, that appears to have been once strongly barricaded. Above are the marks of four loop-hole windows, and of another door-way, now stopped up. Of the uses to which this vault was applied there is no account upon record, but it was most likely a *dépôt* for stores of every kind, "the *stufura* of the garrison." At its south-east corner is an adit, traditionally said to communicate with Tenby; and under the south-east bastion of the castle is another very curious passage, in some parts spacious, and in others extremely narrow, which has been explored to a considerable distance, but its termination is not known. This last is doubtless, however, in a great measure a natural duct; apertures of a similar kind frequently appearing in most limestone rocks. It is supposed by some to penetrate under the keep that rears its proud head in the centre of this magnificent ruin, terminating, as Leland observes, "with a rofe of stone, almost *in conum*, the toppe whereof is keverid with a flat mill-stone." This building is 75 feet in height to the dome, "and in girth 163 feet 7 inches at the base, the mean thickness of the wall being about 14 feet." It is divided into four stories.

The vicinity of the town presents many objects worthy of attention. Close to its south-eastern side is the village of Monekton, so called from its having been the scite of an ancient priory, founded by William Marshall, about the year 1120, as a cell to the Benedictine abbey of St. Martin at Sayes, in Normandy. Part of the priory church is still entire, as is likewise the prior's mansion; but the other buildings are in a state of great decay. From the varied style of the church, it has evidently been erected at different periods. That portion of it which is now appropriated to public worship, is completely modernized within, and scarcely a vestige of its former ornaments remains. This structure has long been the burying-place of the Owens of Orielson, and probably also of their predecessors the Wyrriots, as some early monuments of the latter family still appear here.

The village of Castle-Martyn is situated about three miles to the westward of Pembroke. This place was formerly adorned with a magnificent castle, erected by some Norman chieftain of the name of Martyn, on the scite of an extensive British earthen-work. Few vestiges of that pile now remain, but they appear to have been pretty considerable in the time of Leland. Between this village and the county town is a furzy moor, called Dry-Burrow, which is covered with tumuli, similar to those on the downs of Wiltshire. Northwards from the moor stands Orielson, the seat of the Wyrriot and Owen families; and beyond it is the village of Pwllcrochon, memorable for a skirmish between the royal and parliamentary forces, in March 1648. In the church are several ancient monuments, in honour of the Benegers of Banjeston. In the adjoining parish of Rhôscrowther is Jestington, the residence of a branch of the royal family of Wales, previous to the conquest: it is now the property of the family of Meares. Further to the westward is the village of Nangle, which was formerly a place of very considerable consequence, and had a castle attached to it, some vestiges of which are still visible near the extreme point of the curved promontory, which forms the bay of Nangle.

Cresfely, the seat of John Allen, esq., is situated about two miles and a half to the west of Pembroke. The house occupies an elevated scite, overlooking the river Creswell. Beyond this, on the same road, stands Carew-castle, one of

the most conspicuous features of this county, and celebrated as the residence of characters of great distinction at different eras. It was a royal residence, and formed part of the dowry of Nesta, daughter of Rhys ap Tewdor, who married Gerald de Windfor, lieutenant to Henry I., after the outlawry of Arnulph de Montgomery. The descendants of this lady took the name of Carew, and continued to possess the castle till the reign of Henry VIII., when it reverted to the crown, and was granted to sir John Perrot. In the time of the great rebellion, it was garrisoned for the king, and withstood a long siege; but after the ill success of the royalists at Tenby, it surrendered upon quarter. Subsequent to that period it has been suffered to go to decay, and now constitutes a most magnificent and picturesque ruin. Its form is that of a quadrangle, with a court in the centre, and an immense bastion at each exterior angle. The architecture of this pile belongs to various ages, but a great part of it is undoubtedly coeval with the original structure. The north front is peculiarly grand and majestic, and can boast of windows "than which nothing more nobly magnificent is known in the kingdom." On the south-west side appear a number of old towers, all differing from each other in height, diameter, and form. On three sides this castle is bounded by water, but to the south was formerly a very extensive deer-park, the outer wall of which is yet apparent in many places, though it is divided into several distinct inclosures, in one of which sir Rhys ap Thomas held a tilt and tournament, which was the first show of the kind recorded to have been exhibited in Wales. Near this spot stands one of the early crosses, richly ornamented with true-love knots, &c. and having an inscription upon it, which, though often copied, and submitted to the examination of the curious, has never yet been accurately decyphered. The church here contains several ancient monuments, with effigies and inscriptions in memory of various members of the Carew family.

The other places of note situated in this part of the county are Lawrenny, the seat of Hugh Barlow, esq.; Upton, a castellated mansion, anciently the residence of the Malefants; and Lamphey, or Lansey-court, a noble ruin, once the favourite palace of the bishops of St. David's. A chapel, adjoining this palace, exhibits the remains of a very finished piece of masonry. Stackpool-court, the seat of lord Cawdor, also deserves mention. It is built on the scite of a former castellated structure, and is certainly one of the most splendid modern mansions in Wales. It has two fronts, and is surrounded by very extensive and well-wooded pleasure-grounds, which are further adorned by a beautiful lake, and most luxuriant gardens. The estuary of Stackpool being the only safe and commodious landing-place on this coast, it was much frequented by the predatory chieftains of ancient times, and particularly by earl Harold, some of whose successes are supposed to be commemorated by three large upright stones, which are fixed here at the distance of about a mile from each other. A Historical Tour through Pembrokeshire, by Richard Fenton, Esq., F.S.A., 4to., 1811. The Scenery, Antiquities, and Biography of South Wales, &c. by Benjamin Heath Ma'kin, Esq., M.A., F.S.A., 2d edit. 2 vols. 8vo, 1807. The Itinerary of Archbishop Baldwin through Wales, A.D. 1187, by Giraldus de Barri, translated, &c. by Sir Richard Colt Hoare, Bart., F.R.S., F.S.A., 2 vols. 4to., 1806.

PEMBROKE, a township of America, in Plymouth county, Massachusetts; 30 miles S. by E. from Boston; incorporated in 1752, and containing 1943 inhabitants. Some vessels have been built here.—Also, the *Suncook* of the Indians, a township of Rockingham county, New Hampshire,

on the east side of Merrimack river, opposite to Concord; incorporated in 1759, and containing 982 inhabitants.

PEMBROKESHIRE, or PEMBROCHSHIRE, one of the southern counties of Wales, is bounded on the south by the Bristol channel, on the west and north by St. George's channel, and on the north-east and east by the counties of Cardigan and Caermarthen. It is irregular in its form, and deeply intersected throughout its extensive coast by bays and havens. Its extreme length from north to south is about 35 miles, and its greatest breadth from east to west 29. According to the most accurate surveys, its superficial contents amount to 335,600 acres. According to the population report of 1811, this county is divided into the hundreds of Castle-Martyn, Dewisland, Dungleddy, Kemefs, Kilgerron, Narberth, and Roefe; and contains the city of St. David, and three towns, *i. e.* Pembroke, Haverford-west, and Tenby: it also comprises 142 parishes, and 3 hamlets. The number of houses is stated to be 13,024, inhabited by 60,615 persons, of whom 27,453 are males, and 33,162 females.

At a very remote period this county formed part of the kingdom of Demetia, or Dyvet, which subsisted as an independent monarchy till conquered by Ethelwolf, king of England. Broghmael, king of Demetia, is mentioned as one of the princes who assisted Cassibelanus in compelling Julius Cæsar to evacuate Britain. How far this ancient kingdom extended is uncertain; some supposing it to have comprised the three counties of Cardigan, Caermarthen, and Pembroke; and others, that it was confined to the last mentioned county only. In the time of the Danish incursions, this county suffered more injury than perhaps any other in the principality. Among the chieftains who commanded in these depredations were Hubba and Ivar, or Inguar, both of whom are described by the old writers as men of the "most dreadful ferocity and unheard-of courage."

The name of Pembrokeshire, or rather Pembrochshire, was first given to this county shortly after the Norman conquest, and was evidently derived from that of the town which forms the subject of a former article. This district is not unusually called by the old writers, and even vulgarly at the present day, *Little England beyond Wales*, from the circumstance of the inhabitants in the hundred of Rhos being descendants of Flemings and English, and its courts being formerly subject to the king's writs, as appears by several instances of removed pleas, as late as the reign of Henry VI. Concerning the settlement of the Anglo-Flemish colony here, considerable uncertainty prevails in the writings of historians; some asserting that the Flemings, who had previously settled in England, were driven out of that county by Henry I., and seized upon Rhos as depredators; but others, with more probability, contend, that they came hither under the sanction of the English prince. That they eventually obtained his protection is undoubted, for he placed among them a great number of his own subjects, to teach them the English language, and attach them to English interests. This object he seems to have fully succeeded in; for we find that the English inhabitants of Pembrokeshire were afterwards chief instruments in the subjugation of the remaining portions of Wales. Many attempts were made by the Welsh to extirpate them from the country, but the most determined efforts proved wholly unavailing. At Llandilovaur the decisive battle was fought between Edward I. and Llewellyn, which ensured the final conquest of Wales, and its annexation to the English crown.

In later times, Milford, a port in this county, is remark-

able as having been the landing-place of Henry, earl of Richmond, afterwards king Henry VII., when he came from Brittany to wrest the throne of England from the usurper, Richard III. During the era of the civil wars, in the reign of Charles I., several of its castles, particularly those of Pembroke and Roch, were garrisoned for the king, and withstood long and obstinate sieges in the royal cause. Some skirmishes likewise appear to have been fought within Pembrokeshire, at the same period, and with various success. Even so late as the year 1797, Fishguard is rendered memorable by the landing of a French force of 1400 men in its immediate vicinity; an event which created considerable alarm, but which was attended with trivial injury to the inhabitants. Upon the collection of a considerable body of military, the French general proposed to surrender, which he accordingly did the day subsequent to his landing.

The aspect of this county presents an almost continued succession of "swells, or easy slopes;" but there are no mountainous ridges, excepting one which runs from the coast near Fishguard, to the borders of Caermarthenshire. These hills are locally denominated "the mountains," and the inhabitants distinguish the country with reference to them; the north side being said to be above the mountains, and the south side below the mountains. The central portion of this ridge is known by the name of Percelly, and its highest summit by that of Cwmkerwyn: it commands a view over the whole county. Another high point is called Carn-Englie, as tradition says, from a giant who occupied it as his place of habitation. Vrenny-Vawr, or Vryn-Vawr, is also of considerable altitude and size, as its name imports; the words Vryn Vawr signifying in English the Great-hill. The climate of Pembrokeshire is temperate. Rains are perhaps more frequent here than in any part of England, and are particularly violent during westerly winds. Frosts are neither intense nor of long continuance; nor does snow usually lie upon the ground more than two or three days. Few counties are better watered with rivers, or are more abundantly supplied with excellent springs. The names of the chief rivers are the Cwch, which divides Pembrokeshire from Cardiganshire; the Nevern, which flows by Newport; the Gwain, which falls into the sea at Fishguard; the Taf, which forms the boundary with Caermarthenshire; and the East and West Cleddy, or Cleddaw. The two last unite near Picton-castle, and flow into Milford haven: they are influenced by the tide as high almost as the half of their whole course.

The mineralogical products of Pembrokeshire are coal, limestone, freestone, and that "species of marble called pudding-stone." No metallic ores, except iron, we believe, have yet been discovered here; at least none of any consequence in a commercial estimate. Some mineral springs, particularly one in the parish of Fishguard, however, are strongly tinged with that metal; and on the Trefin are several works of iron and tin. The soil is various, but in general tolerably fertile. The state of agriculture, however, is defective, and, though much improved within the last few years, it is still susceptible of great amelioration. The practice of grazing has been introduced, as well as a spirit of "farm monopoly." Woods are rather scarce in this county, particularly towards the western coast, where, being much exposed to the winds blowing from the sea, they are thorn in a very curious manner. Cattle are reared in considerable numbers, and a large quantity of butter is made, both for home consumption and for exportation.

Pembrokeshire cannot boast of being either a manufacturing or a trading county; though it possesses manifest advantages, for commerce at least, in its numerous natural
harbours

harbours and great extent of coast. Haverford-west is the only town within its limits which has a cotton manufactory of any consequence; and all the attempts hitherto made for the introduction of the linen business have completely failed. Milford and Fishguard alone can justly claim the appellation of trading ports, and even in these towns the exports and imports are extremely limited; but they are certainly susceptible of great augmentation, with a very little exertion and expence. Indeed we have no doubt, but that if the spirit of manufacturing and commercial enterprise was once properly excited and fostered, Pembroke-shire would, from its natural advantages of situation, soon become the trading emporium of Wales. At Milford has lately been established a South sea whale-fishery, which is in a flourishing condition; and we are happy to observe, that the same thing may be affirmed of the herring-fishery of Fishguard, though it might be improved to an almost unlimited extent.

Pembroke-shire abounds with objects of antiquarian curiosity and interest, of almost every kind and era. Druidical circles and cromlechs are frequent, of which the principal are those near Castle-Hendrev, Drewson, Trellys, Long-house, Lech-y-dribedd, Pentre-Evan, and Castle-Martyn. Single stone monuments are also numerous, particularly along the coast, where they are conjectured to have been raised as memorials of predatory battles. The great Roman road to Menapia, St. David's, enters the county near Llandewi-Velfry, and proceeds by Haverford-west and Roch-Castle, almost on the same line with the present turnpike-road from Caermarthen, which it crosses at different points. Another Roman road led from the great road to the station, called Ad-Vicissimum. But the most important antiquities are its castles, of which there are nineteen mentioned as belonging to princes and great barons. Some of the churches in this county are likewise objects worthy the attention of the antiquary. The cathedral and palace of St. David's are particularly entitled to attention. See *St. DAVID'S*; also Norris's *Archæological Antiquities of Wales*, 4to. Fenton's *Historical Tour in Pembroke-shire*, 4to, 1811. *Cambrian Register* for 1796. *Camden's Britannia*, vol. ii.

PEMIGEWASSET, a river of America, in New Hampshire; one branch of it proceeds from Mousie-hillock mountain, another from the south-west extremity of White mountains, and a third from the township of Franconia. Its course of about 50 miles is generally south, and it receives on both sides a number of streams. After the union of the Winipiscogee river, at the lower end of Sanborn town, it bears the name of Merrimack to the sea.

PEMNAGUR, a fort of Hindoostan, in Bahar; 31 miles N.W. of Durbungah. N. lat. 26° 29'. E. long. 85° 45'.

PEMPHIGUS, in *Medicine*, from $\pi\epsilon\mu\phi\iota\gamma\iota\varsigma$, *bullæ*, a *bleb* or *blain*, has been variously called the *vesicular fever*, *febris vesicularis*, *ampullosa*, and *bullosa*, by the continental physicians, who have mentioned the disease.

From the descriptions of a few of these writers, Sauvages constituted this disease a distinct genus, in his system of nosology, and gave it the appellation of pemphigus, which has been adopted by subsequent authors, with the exception of Linnæus, who designated it by the barbarous term *morta*, conceiving it to be a most mortal pestilence. "Febris diaria, malignissima, funestissima." (See his *Genera Morbor.*, class i. gen. 1.) Upon the authority of Sauvages, and the authors whom he quotes, the pemphigus has been defined an idiopathic, contagious, and malignant fever, in the course of which, phlyctænæ or vesications, of the size of a silbert, with an inflamed base, appear in succession on different parts of the surface of the body, and sometimes in

the mouth. See Sauvages, *Nofol. Method.*, class iii. gen. 3. Cullen, *Nofol. Meth.*, gen. xxxiv.

Nevertheless, it is pretty clear, from an examination of the imperfect histories of the subject, that there is no such idiopathic and contagious disease, terminating in a critical eruption of bullæ, as has been thus defined, under the appellation of pemphigus. Dr. Cullen justly expressed his doubts of the accuracy of the original writers; and, after giving his definition of the disease, he says, "From the opinion of others, rather than my own, this character is taken; because I have seldom seen such a disease, and never have observed it epidemical, or pursuing a regular course, as is here described." And in respect to the species, he observes again, "Since I have never seen a pemphigus, which I could consider as an exanthematous fever, and have found only very few observations in the writings of physicians concerning a disease of this kind, almost every thing inserted in my nosology must necessarily be taken from Sauvages; therefore, I have followed him, though I would willingly have omitted this malady, since almost all that has been said about it appears to me doubtful, obscure, and ambiguous."

Dr. Willan has examined the matter more minutely, and pointed out the fallacious foundation, upon which the notion of such an epidemic contagion has been built. Sauvages has enumerated three species of pemphigus, not from his own observation, but merely from the description of three writers. The first species, pemphigus major, which is taken from a single case, related by Scaliger, (*Ephem. Acad. Nat. Curios.* Dec. 1. ann. viii. obs. 56.) which is worthy of little attention, was perhaps, as Dr. Willan suggests, a mere erysipelas, with some incidental variation in the appearance of the bullæ. The account of the epidemic at Prague, mentioned by Thierry, (see his *Medicine Experimentale*, p. 134.) which is the prototype of the second species (pemphigus castrensis) of Sauvages, is not entitled to credit, as Dr. Cullen remarked, in several of its circumstances: the bullæ are supposed by Dr. Willan to have been symptomatic of severe typhus, or of pestilential fever, in the same manner as they appeared in the plague of 1666 in London, as described by Dr. Hodges, and as they are occasionally seen, intermixed with petechiæ and vibices, or with patches of erythema, in typhoid fevers. Again, as to the third species (pemphigus helveticus) of Sauvages, which was borrowed by him from the description of Dr. Langhans, (in the *Acta Helvetica*, vol. ii. p. 260.) Dr. Cullen was of opinion, that the disease was in fact *cyanche maligna*; and Dr. Frank viewed it in the same light; for he considered it as a variety of scarlatina, accompanied with ulceration. Dr. Willan, who points out the unsatisfactory nature of the history given by Langhans, and the contradictions which it involves, proposes a query, whether the disease was not rather *endemic*, than epidemic or contagious, and referrible to dearth, or some other local cause, like the *ergot*, *mal des ardens*, &c. See his *Treatise on Cutaneous Disorders*, part iv.; and *Bateman's Synopsis of Cutaneous Diseases*, p. 135.

In short, it is evident, that the description of an idiopathic contagious fever, terminating in a critical eruption of bullæ, after the manner of the small-pox, and other exanthematous fevers, which Sauvages and the nosologists have given us, has been founded in misconception; and that no such disease exists. Yet many cases of *bullous* disease have been recorded, under the appellation of pemphigus, by medical men of considerable discernment. Those who are curious, and disposed to investigate the matter, will find such cases described by Mr. Gaitskell and Mr. Upton, in the

the Memoirs of the Medical Society of London, vol. iv. art. 1, and vol. iii. Appendix; by Mr. Christie, in the Lond. Med. Journal, vol. x. p. 385; by Dr. Stewart, in the Edin. Med. Comment., vol. vi. p. 79; by Dr. Hall, in Duncan's Annals of Med., vol. iii. art. ix; by Mr. Ring, in the Lond. Med. Journal, vol. xi. p. 235; by Dr. Dickson, in the Trans. of the Royal Irish Acad. for 1787; and in the Lond. Med. Journ., vol. ix. p. 309; by Bang, in the Acta Reg. Soc. Med. Haerleensis, vol. i. p. 8, &c.; by Withers, in his Treatise on Asthma; and by Frank, De Curand. Hom. Morb., lib. iii. p. 263. The reader will find, however, that, in these cases, the eruption of *bullæ* has either been chronic, and altogether unconnected with fever; or it has occurred in connection with common fever, dysentery, &c. in which it was merely accidental and symptomatic, and by no means the result of any particular contagion, or indicative of a distinct and peculiar species of fever.

The more common eruptions of these water-blebs, or bullæ, is unconnected with any acute fever; and, for the sake of distinguishing them from this supposititious pemphigus, Dr. Willan arranged them under a new genus, POMPHOLYX; which see.

PEMPHINGODES, or PEMPHIGODES, from the same root with the preceding, was an epithet applied by the ancients to certain fevers, said to be distinguished by flatulencies and inflations, in which they supposed some aerial effluvia passed through the skin of the patient, and was sensible to the finger of a person applied to it. (Galen, Comment. on 6. Epidem., sect. 1. app. 17.) It is not easy to refer such a description to any known disease.

Foësius says, the febris pemphingodes was supposed to be a fynochus, in which the blood-vessels were inflated, and consequently it was called an inflated fever. Both the term and the absurd hypothesis have been long obsolete.

PEMPHIS, in Botany, so named by Forster, from $\rho\epsilon\mu\phi\iota\varsigma$, a globule, in allusion to the globular protuberance of the germen above the calyx, or of what, in Linnæan language, is the receptacle of the flower. Forst. Gen. t. 34. Juss. 331. Venten. v. 3. 299. (Lythrum; Lamarck Illustr. t. 408. f. 2.)—Class and order, *Dodecandria Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Salicariæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, turbinate, permanent, striated, regular, with twelve teeth, the intermediate ones smallest. Cor. Petals six, obovate, obtuse, spreading, inserted by their claws into the throat of the calyx, at the base of each lesser segment. Stam. Filaments twelve, awl-shaped, shorter than the corolla, inserted into the middle of the calyx, the six alternate ones shortest; anthers ovate, two-lobed, incumbent. Pist. Germen globose; style short, cylindrical, erect; stigma capitate, depressed. Peric. Capsule turbinate, invested with the permanent calyx, of one cell, opening by a hemispherical deciduous lid. Seeds numerous, wedge-shaped, abrupt, compressed, with a fungous angular border. Receptacle central, short, triangular, muricated.

Ess. Ch. Calyx regular, with twelve teeth. Petals six, inserted into the calyx. Capsule of one cell, splitting horizontally. Seeds numerous, bordered.

Obs. This genus is essentially different from *Lythrum*, in having a capsule which bursts horizontally, and which consists of one cell instead of two. In an early state, we suspect, the germen has three cells. The hemispherical lid of the capsule is obscurely marked with six concentric lines, which, it seems, Forster mistook, in an unripe state perhaps, for six valves. We readily assent to the maxim of the younger Linnæus, Suppl. 25c, that a natural genus ought not to be divided on account of a single peculiarity in any

one species; but where the habit is so different, and the technical character so important, as in the present case, besides both being supported by several secondary distinctions, there can no longer be room for hesitation, though only a solitary species of *Pemphis* has hitherto been discovered.

1. *P. acidula*. Forst. Gen. 34. (Lythrum Pemphis; Linn. Suppl. 249. Forst. Prodr. 36. Mangium porcellanicum; Rumph. Amboin. v. 3. 126. t. 84.)—Rumphius mentions this as growing on the muddy shores of some parts of Amboyna, or its neighbourhood. The late Mr. Christopher Smith sent us specimens, gathered in April 1797, in flower and fruit, at Nufalout. Koenig's, in the Linnæan herbarium, were found on the sea coast of Ceylon. Forster obtained his in the island of Teautea.—The stem is shrubby, decumbent, with many hoary, rigid, leafy branches. Leaves crowded, opposite, on short stalks, obovate, entire, about an inch long, coriaceous or fleshy, silky on both sides, especially when young. Rumphius, whose figure represents them rather too much pointed, says they have an agreeable salt flavour, and are eaten raw as a sauce to some kinds of fish. The flowers are axillary, solitary, on simple stalks rather shorter than the leaves, silky, as well as the calyx, which is the size of a pea. The petals are wavy, and described by Koenig as of a pale blueish hue. Lamarck, in his t. 408. f. 2, gives a sufficiently good, and apparently original, representation, of the whole plant in flower. Rumphius exhibits it in fruit only. We have never seen a specimen from Forster, but there surely can be no doubt as to the identity of his plant.

PEMPTÆUS, a word used by medical writers, as the name of an ague, the fits of which return always on the fifth day.

PEN, according to Camden, originally signifies a high mountain, which was thus called among the ancient Britons, and even the Gauls. And hence, that tall range which parts Italy and France is called *Apennines*.

PEN is often used for a pound, or head of water, artificially kept up.

PEN is also a little instrument, usually formed of a quill, and serving to write with.

PENS, Dutch, are those made of quills which have been passed through hot ashes, to take off the grosser fat and moisture thereof.

PEN, Fountain. See FOUNTAIN-PEN.

PEN, Sea, pennatula, in Natural History, a genus of zoophyte, which, though it swims about freely in the sea, approaches near to the gorgonia. This genus hath a bone along the middle of the inside, which is its chief support; and this bone receives the supply of its osseous matter by the same polype mouths that furnish it with nourishment. Linnæus reckons seven species. See PENNATULA.

PEN Stock, a sort of sluice or flood-gate placed in the water of a mill-pond, or a canal, to retain or let it go at pleasure.

PEN Unglas, in Geography, a cape of South Wales, on the N. coast of the county of Pembroke. N. lat. $51^{\circ} 57'$. W. long. $4^{\circ} 59'$.

PEN Dinas, a cape of Wales, on the N. coast of St. Bride's bay. N. lat. $51^{\circ} 48'$. W. long. $5^{\circ} 10'$.

PENA. See PEENE.

PENA Cova. See PEGNA Cova.

PENA, JOHN, in Biography, an able French mathematician in the 16th century, was descended from a noble family at Aix in Provence, and born at Moustiers, in the diocese of Riez, about the year 1530. He distinguished himself in early life by his proficiency in the Latin and Greek languages, and philosophy; but the bent of his genius particularly

cularly directed him to the study of the mathematical sciences. About the year 1556, he was appointed professor of mathematics in the College Royal; and, according to some writers, his post was professorship-extraordinary, created out of compliment to his great merit, and suppressed after his death. He published a Latin version of the *Catoptrics* of Euclid, with a curious preface, explaining and illustrating the uses of the cylindrical mirror, the "Optics" of the same geometrician; "Euclid's *Elementa Musicae*; *Sectio Regulæ Harmonicæ*," in Greek and Latin; and a Latin version accompanying the Greek text of "The *Spherics* of Theodosius." He composed some papers on the "Mechanics of Hero," and the "Geometry of Euclid," which have not been published. This young mathematician was prematurely cut off by a violent fever in 1560, when only thirty years of age. Moreri.

PENAC, in *Geography*, a town of Naples, in Abruzzo Citra; nine miles E.S.E. of Civita Borella.

PENÆA, in *Botany*, received that appellation from Linnæus, in memory of the learned Peter Pena, a native of Jouques, near Aix, in Provence; who afforded great assistance to Lobel, in the composition of his *Adversaria*; not only by his general botanical learning, but by the communication of many rare plants of the south of France; see LOBEL. Plumier had already consecrated a plant to his honour, which Linnæus reduced to POLYGALA; see that article.—Linn. Gen. 56. Schreb. 76. Willd. Sp. Pl. v. 1. 626. Mart. Mill. Dict. v. 3. Thunb. Prodr. 30. Ait. Hort. Kew. ed. 2. v. 1. 248. Juss. 419. Lamarck Illustr. t. 78.—Class and order, *Tetrandria Monogynia*. Nat. Ord. uncertain.

Gen. Ch. Cal. Perianth inferior, of two equal, opposite, lanceolate, concave, coloured, lax, deciduous leaves, half the length of the corolla. Cor. of one petal, bell-shaped; limb in four acute spreading segments, very much shorter than the tube. Stam. Filaments four, extremely short, erect, naked, inserted into the corolla between its segments; anthers erect, flattish, notched at each end. Pist. Germen superior, ovate, quadrangular; style with four membranous, dilated, longitudinal angles; stigma cruciform, obtuse, permanent. Peric. Capsule quadrangular, crowned with the style, of four cells and four valves. Seeds in pairs, rather oblong, obtuse.

Efl. Ch. Calyx of two leaves, inferior. Corolla bell-shaped, of one petal. Style quadrangular. Capsule square, of four cells, with eight seeds.

The species of this genus are singularly confounded by Linnæus. We shall attempt, by the help of his own specimens, to reduce their characters and synonyms to order. They are all natives of the Cape of Good Hope, or the adjacent regions of southern Africa. Their habit is shrubby. Leaves crowded, opposite, nearly or quite sessile, rather fleshy, undivided, entire, in almost every instance perfectly smooth. Flowers terminal or axillary, solitary or aggregate, generally handsome, red, white, or yellow. Nobody has settled the natural order of *Penæa*, nor have we a conjecture to offer on the subject. Jussieu merely hints at its possible affinity to his *Acanthi*, which we see little to countenance. Its habit, but not its characters, bears some resemblance to *Boronia*, Sm. Tracts, one of the *Rutaceæ*.

1. *P. Sarcocolla*. Linn. Sp. Pl. 162. Berg. Cap. 35. (*P. fucata* Linn. Mant. 199. Lamarck f. 1. Willd. n. 6. P. n. 48; Linn. Mat. Med. 16, character and synonym erroneous. *P. mucronata*; Berg. Mat. Med. v. 1. 68? *Tithymali myrsinites* species, arbuscula æthiopica, subrotundis foliis, e stoechadis arabicæ squamato capitulo duro lachrymam fundens; Pluk. Mant. 183. t. 446. f. 6.)—Leaves

ovate, somewhat rhomboid, acute. Bractæas wedge-shaped, pointed, coloured. Calyx-leaves linear.—Native of hills at the Cape. A humble, much-branched, bushy shrub. Leaves about half an inch long, of a pale tawny glaucous hue in the dried plant, their mid-rib rather convex. Flowers few together, at the tops of the branches, rather longer than the leaves. Bractæas but half the size of the leaves, entire, smooth, red, as well as the calyx. Segments of the corolla rounded, obtuse, slightly spreading. There is no appearance of gum about the flowers, and whether this, or any other species of *Penæa*, really yields the gum-resin called, from its reputed healing or conglutinating virtues, *Sarcocolla*, or flesh-glue, appears to be very doubtful and very unimportant. Modern surgery disclaims such aids, and has long ceased to confide in them.—Plukenet's imperfect figure is evidently done from this species, though his definition rather points at *squamosa* hereafter mentioned.

2. *P. mucronata*. Linn. Sp. Pl. 162. Berg. Cap. 37. Willd. n. 2. Ait. n. 1. Vent. Malmaif. t. 87. (*Tithymali myrsinites* species, arbuscula æthiopica, folio parvo e lato basi in acutissimum mucronem subito desinente, capitulis origani; Pluk. Mant. 183.)—Leaves heart-shaped, pointed, horizontal. Flowers in dense terminal spikes. Bractæas somewhat lunate, pointed.—The numerous, small, horizontal leaves, crossing each other in pairs, and the copious dense spikes of yellow flowers, whose corolla is not very unlike in size and figure to *Arbutus Unedo*, characterize this species. Plukenet's comparison of the beads to *Origanum* is strikingly opposite, as to the dried plant. Linnæus, in Syft. Veg. says the flowers are red, having been misled perhaps by the dried specimen. This species was sent to Kew by Mr. Masson in 1787, but has not flowered there.

3. *P. marginata*. Linn. Mant. 199. Willd. n. 3.—Leaves heart-shaped, rather concave, thick-edged, shining. Flowers lateral, axillary.—Found near rivers at the Cape. The branches are straight and wand-like, often ternate. Leaves three quarters of an inch long; dark green and shining above; paler and yellowish beneath, resembling some kind of *Celastrus* or *Buxus*; their edges remarkably thickened. Flowers not quite so long as the leaves, sessile, reddish in the dry state, but Linnæus says they are white.

4. *P. lateriflora*. Linn. Suppl. 122. Willd. n. 4.—Leaves ovate, flattish, opaque. Flowers lateral, axillary. Very distinct from the last, notwithstanding the doubt expressed by Willdenow. The leaves are rather larger, not heart-shaped, nor thickened at the edges. Flowers also larger, extending a little beyond their corresponding leaves.

5. *P. tomentosa*. Thunb. Prodr. 30. Willd. n. 5.—"Flowers lateral. Leaves ovate, downy."—Of this we have seen no specimen, but the downy leaves are peculiar to it.

6. *P. squamosa*. Linn. Mant. 331. Willd. n. 7. Linn. Sp. Pl. 162? the observation at the end certainly misapplied. (*P. Sarcocolla*; Willd. n. 1. Lamarck f. 2. *P. tetragona*; Berg. Cap. 36.)—Leaves obovate, somewhat wedge-shaped, fleshy. Bractæas fringed, glutinous, larger than the leaves. Segments of the corolla reflexed.—Distinguished by its large terminal flowers, enveloped in dark red, glutinous, broad, densely fringed bractæas. The leaves most resemble the first species, but their mid-rib is depressed, not prominent, and their colour in a dried state very dark. Linnæus at first marked his specimen *Sarcocolla*, then *resinosa*, and finally *squamosa*, under which last appellation he described this fine plant. It may, perhaps, yield a gum, as well as the first species. The corolla seems to be white or yellowish; its tube is above an inch long; the segments of the limb

ovate,

ovate, obtuse, reflexed. Lamarck's figure is much diminished as to the parts of fructification.

7. *P. fruticulosa*. Linn. Suppl. 121. Willd. n. 8.—Leaves obovate, obtuse. Flowers capitate, terminal. Tube of the corolla ovate; segments acute, erect.—Gathered by Sparrmann at the Cape. A dwarf bushy shrub, with leaves hardly half an inch long. Flowers most like those of *P. mucronata*, but much fewer together, and their corolla has a shorter tube, with a longer limb. The bractæ are said in the specific character to be orbicular and acute, but in the description to be wanting. The former is most near the truth, but they are ovate, acute, and fringed.

8. *P. myrtilloides*. Linn. Suppl. 122. Willd. n. 9.—(*P. myrtilloides*; Thunb. Prodr. 30.)—Leaves ovato-lanceolate, acute, many-ribbed. Flowers terminal. The myrtle-like leaves, (not at all like those of *Vaccinium Myrtillus*.) form the characteristic mark of this species. They are very green in the dried specimen, numerous, crowded, erect, not quite an inch long, marked with one prominent central rib, and several lateral ones. The flowers are terminal. Our specimen will not allow us to determine much of their structure, but Linnæus says they are “nearly solitary, surrounded with green acute bractæ, under which are two small leaves; the calyx acute, green, by no means coloured.”—Such is his *Penæa myrtilloides*; but its silky inner bark, and whole aspect, indicate a very different family of plants, the *Daphne* tribe, to which we have no doubt this species belongs. Indeed it comes so near to *Guidea oppositifolia*, we are almost persuaded of its being that very plant, with rather more luxuriant foliage than usual. S.

PENAL ACTION. See ACTION.

PENAL Statutes. See STATUTES.

PENALTIES NEGATIVE. See NEGATIVE.

PENALVA, in *Geography*, a town of Portugal, in the province of Beira; nine miles N. of Coimbra.

PENAMOUSHILY, a town of Hindoostan, in the circar of Rajamundry; 42 miles E. of Rajamundry.

PENANCE, PÆNITENTIA, is properly the exercise of penitence; and may be defined a punishment, either voluntary, or imposed by legal authority, for the faults a person has committed.

The Romanists define penitence, a sacrament wherein a person, who has the requisite dispositions, receives absolution at the hand of the priest, of all sins committed since baptism.

To a legitimate penance they require three things, contrition, absolution, and satisfaction.

Their priests receive a power of administering the sacrament of penance, when they receive the priesthood; but to exercise this power, it is required they have the jurisdiction of an ordinary, *i. e.* that they have a benefice, either original or delegated; with the approbation of the bishop to hear confessions. See POKERY.

PENANCE is particularly used in the Romish church, for the penalty which a confessor imposes, for the satisfaction of the sins of which a person is absolved.

The ancient discipline, Du Pin observes, was very severe on the head of penance: for great crimes people were excluded the communion of the church, expelled the assemblies of the faithful, obliged to fast, and to mortify themselves publicly, even at the church-door, cut their hair, go always on foot, &c.

He adds, that those who had done public penance were never admitted into the clergy; and that public penance was never granted more than once. Those, who fell a second time, were never to be reconciled to the church, and were to look for pardon only at the hands of God.

VOL. XXVI.

PENANCE, in our *Common Law*, is an ecclesiastical punishment, used in the discipline of the church, and affecting the body of the penitent; by which he is obliged to give a public satisfaction to the church, for the scandal he hath given by his evil example. In the case of incest, or incontinency, the offender is usually enjoined to do a public penance in the cathedral, or parish church, or public market, barelegged and bareheaded in a white sheet, and to make an open confession of his crime in a prescribed form of words, which is augmented or moderated according to the quality of the fault, and the discretion of the judge. So in smaller faults and scandals, a public satisfaction or penance, as the judge shall decree, is to be made before the minister, churchwardens, or some of the parishioners, respect being had to the quality of the offence, and circumstances of the fact, as in the case of defamation or laying violent hands on a minister or the like. And as these censures may be moderated by the judge's discretion, according to the nature of the offence: so also they may be totally altered by a commutation of penance: and this hath been the ancient privilege of the ecclesiastical judge to admit that an oblation of a sum of money for pious uses shall be accepted in satisfaction of public penance. But penance must be first enjoined, before there can be a commutation; or otherwise it is a commutation for nothing. Linwood and other canonists mention three sorts of penance; *viz.* private, enjoined by any priest in hearing confession; public, enjoined by the priest for any notorious crime, either with or without the bishop's licence according to the custom of the country; and solemn, the particulars of which are prescribed by the constitution of archbishop Peckham. By the statute of “Circumspecte agatis” (13 Edw. I. stat. 4.) the king to his judges sendeth greeting: use yourselves circumspectly concerning the bishops and their clergy, not punishing them if they hold plea in court christian of such things as be mere spiritual, that is to acts of penance enjoined by prelates for deadly sin, as fornication, adultery, and such like; for the which sometimes corporal penance, and sometimes pecuniary is enjoined (2 Roll. Rep. 384.); in which cases the spiritual judge shall have power to take knowledge, notwithstanding the king's prohibitions. By the statute of “Articuli cleri,” (9 Edw. II. stat. 1. c. 2.), if a prelate enjoins a penance pecuniary to a man for his offence, and it be demanded; the king's prohibition shall hold place; but if prelates enjoin a penance corporal, and they which be so punished will redeem upon their own accord such penance by money; if money be demanded before a spiritual judge, the king's prohibition shall hold no place. And by the same statute (c. 3.), if any lay violent hands on a clerk, the amends for the peace broken shall be before the king, and for the excommunication before a prelate, that corporal penance may be enjoined; which if the offender will redeem of his own good will, by giving money to the prelate, or to the party grieved, it shall be required before the prelate, and the king's prohibition shall not lie.

PENAT, in *Geography*, a town of Hindoostan; 30 miles S.S.E. of Agra.

PENATES, in the *Ancient Mythology*, a term applied to all the domestic gods, whom the ancients adored in their houses: whence they are ordinarily confounded with the lares. See LARES.

Authors are not all agreed about the origin of the dii penates, who were properly the tutelary gods of the Trojans, and were only adopted by the Romans, who gave them the title of penates.

De Meziriac, in his notes on Dido's Epistle to Æneas, relates at large what he has met with in the ancient writers

on the subject: Dionysius Halicarnassus tells us, that Æneas first lodged these gods in the city Lavinium; and that his son Ascanius, afterwards, upon building the city Alba, translated them thither; but that they returned twice miraculously to Lavinium. The same author adds, that in Rome there is still seen a dark temple, shaded by the adjacent buildings, wherein are the images of the Trojan gods, with the inscription, DENAS, which signifies penates. These were the public penates of the city and empire, and their temple was near the circus Maximus. A light was continually burning before them, and libations and incense were offered upon almost all occasions. Lucan observes, that in time of peace, the Romans used to hang up their arms, in the place belonging to their household gods, as intrusting them to their custody; and that it was esteemed an abominable sacrilege to commit murder in the presence of Vesta, that is, in the entry, and before the perpetual fire of the household gods.

The images above-mentioned represent two young men sitting, each of which holds a lance. I have seen, adds Dionysius, several other statues of the same gods in ancient temples; who all appear like young men dressed in habits of war.

Varro fetches these penates from Samothrace to Phrygia, to be afterwards transported by Æneas into Italy. Macrobius, who relates this from Varro, adds also, that they were called penates, from the Latin words *per quos penitus spiramus*, which seems a mere subtilty. But the real etymology must be sought in the Phrygian, not the Latin tongue.

Cicero, in Aulus Gellius, derives the name hence, *quod penes nos nati sunt*. Yet in his book de Nat. Deor. he says, it is formed from *penus*, provision: or, perhaps, adds he, *quod penitus insident*; others say, *quia coluntur in penetralibus*.

Rosinus distinguishes among the penates: he makes an order of penates of the heavens, such as Pallas in the ethereal region, Jupiter in the middle region, and Juno in the lowest; besides penates of cities, penates of private families, &c. On which footing the *dii penates* were the guardians or tutelary gods of every thing.

Nigidius, an ancient author cited by Arnobius (Adv. Gent.) distinguishes four sorts of penates: those of the class of Jupiter, or chosen from among the celestial gods: those of Neptune, from the sea-gods: those of Pluto's class from among the infernal gods: and those taken indifferently from the class of all the deified men.

It is a popular question among the learned, who were the penates of Rome? Some say, Vesta; others Neptune and Apollo; Vives says, Castor and Pollux; with whom agrees Vossius, who adds, that the reason of their choosing Castor and Pollux in quality of penates, might be the important service they did the Romans in the war against the Latins.

Nor are authors more unanimous on the subject of the penates which Æneas brought into Italy. Some say they were Neptune and Apollo, who built the walls of Troy; others, Jupiter, Juno, and Minerva; and others Cælus and Terra.

Dionysius Halicarnassus, lib. i. speaking of the *dii penates*, tells us, that the historian Timæus has written, that the figure, statue, or effigy of the denates, or penates, was nothing but a crooked iron, or copper rod, and a Trojan vessel from potters' ware: and that this was all Æneas brought to Troy. But, for himself, he assures us, he had seen a temple at Rome, near the forum, where those gods were represented sitting, under the form of two young men, having each of them a dart in his hand: he adds, that the inscription was

DENATES, for that the ancients, before the invention of the letter P, used a D instead of it: But Dionysius might be mistaken: for the bottom of the P is frequently so very small on medals, that there is no sensible difference between a P and a D; which might be the case in the inscription that author mentions; for that the ancient inhabitants of Italy had no P, is a mistake sufficiently refuted by many proper names still remaining of the most early ages, *e. gr.* Capys, Capetus, Picus, Pallas. Nor were the Trojans without the same, witness Palinurus, Paris, Priamus, &c.

The penates seem to have originated in a vulgar opinion which prevailed very generally amongst mankind, that the manes of their ancestors took pleasure after death to dwell in their houses, where indeed they were frequently interred, and where their pictures used to be preserved in the places that were most respected. After having been accustomed to consider them under the character of illustrious persons, they by degrees paid them respect and homage, they then implored their assistance, and lastly they succeeded to the worship and religious ceremonies. The penates were therefore the manes of their ancestors, which St. Augustine (de Civ. Dei. l. ix. c. 11.) maintains, on the authority of Apuleius and Photinus; and in process of time they were associated with all the other gods without distinction.

The statues of these gods were made not only of wax, as some authors pretend, but indifferently of all sorts of materials, even of silver itself: they were consecrated in the most secret places; altars were erected to them, lamps kept burning, and symbols added, all of them expressive of vigilance. Anciently children were offered to them in sacrifice, but Brutus, who expelled the Tarquins, discontinued this barbarous practice, and from that time nothing was offered to them but wine, incense, fruits, and sometimes bloody victims, lambs, sheep, &c.: their statues were likewise crowned with festoons of garlic and poppy. In the public sacrifices offered to the penates, they sacrificed to them a fow. It was in the time of the Saturnalia, that they celebrated the festival of the lares and penates, and there was a day besides in each month set apart for the worship of these domestic gods. At the temple consecrated to these gods in Rome, there was set apart for them a holiday, which was observed with much solemnity; and this was the second of the kalends of January, or the last day of December. To this were added the games called "Compitales." Indeed, the respect paid to the penates was so great that no important enterprise was undertaken without consulting them: their figures were even sometimes carried about in journies, as we learn from Apuleius: "Wherever I go," says he, "I always carry with me in my journey the figure of some god."

The figure of the gods penates was sometimes the single representation of some god, genius, hero, or demi-god, or lastly of some famous ancestor: frequently they were pantheons, that is such as were charged with the symbols of several divinities. It is probable that some of the penates delivered oracles.

Authors have conjectured, that the idols which Jacob brought from the house of Laban his father-in-law, and which the scripture denominates "theraphim," were gods penates, whose worship was propagated afterwards into Phrygia, and transmitted from thence into Greece and Italy. This, it is confidently asserted, was their true original.

PENATOLEN, in *Geography*, a town of Chili; 20 miles E. of St. Yago de la Nueva Estamadura.

PENATOOR, a town of Hindoostan, in the Carnatic; eight miles W. of Gingee.

PENBRAY, a cape on the S. coast of Wales, in the British channel; 3 miles S. of Kidwelly.

PENBUGHTOE HEAD, a cape of South Wales, on the N. coast of the county of Pembroke. N. lat. $51^{\circ} 56'$. W. long. $5^{\circ} 5'$.

PENCARROW, a cape in the English channel, on the S. coast of Cornwall; two miles E. from the river Fowey.

PENCE, PETER-PENCE. See *PETER-pence*.

PENCE, Pitching. See *PITCHING-pence*.

PENCIL, from *peniculus, penicillus, or penicillum*, which signify the same, formed by diminution of *penis*, an instrument used by painters for the application of their colours. There are pencils of various kinds, and made of various matters: the most usual are of badgers' and squirrels' hair, those of swans' down, and those of boars' bristles; which last are bound to a stick bigger, or less, according to the uses they are defined for; and when large, are called *brushes*. The others are inclosed in the barrel of a quill. The ancients, M. Felibien observes, had pencils made of little pieces of sponge; whence, doubtless, the story of the painter, who, not able to express the foam of a horse, succeeded by throwing the sponge at the picture.

PENCIL, Black-lead. See *BLACK-LEAD*.

PENCIL-CASE. See *PORT-CRAJON*.

PENCIL, in Electricity. See *BRUSH, and ELECTRICITY*.

PENCIL of Rays, in Optics, is a double cone, or pyramid of rays, joined together at the base; one of which hath its vertex in some part of the object, and has the crystalline humour, or the glass GLS (*Plate XVII. Optics, fig. 10.*) for its base; and the other has its base in the same glass, or crystalline, but its vertex in the point of convergence; as at C.

Thus BGSC is a pencil of rays; and the line BLC is called the axis of that pencil.

PENCIL, in Ancient Armour, a small streamer fixed to the end of a lance, and adorned with the coat-armour of the esquire, by whom it was carried, and which served to point him out in the day of battle.

PENCK, in *Geography*, a town of Germany, in the principality of Culmbach; 4 miles N.E. of Bayreuth.

PENCKUM, a town of Anterior Pomerania; 13 miles S.W. of Old Stettin. N. lat. $53^{\circ} 15'$. E. long. $14^{\circ} 20'$.

PENDANT, EAR-RING, an ornament of gold, or some precious stone, worn by the ladies; hung by a hole made for that purpose through the ear; and frequently enriched with diamonds, pearls, and other precious stones.

The pendants of the European ladies are nothing in comparison of those worn by the East Indians, both men and women; among whom it is the fashion to lengthen out the ears, and to enlarge the hole, by putting in pendants of the size of saucers, set with stones.

In the West Indies, Columbus named a certain coast Oreja, because he found people with holes in their ears big enough to pass an egg through.

They make holes too in their lips and nostrils, and hang pendants at them: which is also practised by the Mexicans, and other nations.

PENDANT, in Heraldry, a term applied to the parts hanging down from the label, to the number of three, four, five, or six at most. These must be specified in blazoning, when there are more than three. They resemble the drops at the bottom of the triglyphs in the Doric frieze.

PENDANT Barometer. See *BAROMETER*.

PENDANT Capital, a mass of sculptured stone, or other material, in the form of the capital of a column, with ribs and

arches springing from it, which seems to support the general vaulting, but which, in fact, being destitute of a supporting column, is inserted into and hangs from that vaulting. This piece of mechanism belongs to the third order of pointed architecture, and may be seen to advantage in the chapel of King's college, Cambridge, Henry VIIIth's chapel, Westminster, &c. See *GOTHIC Architecture*.

PENDANT Feathers, in Falconry, are those feathers which grow behind the thighs of a hawk.

PENDANT Gardens, in Antiquity. See *PENSILES Horti*.

PENDANTS, among Florists, a kind of globules, growing on stamina, or chives. Such are those in the middle of tulips, lilies, &c. See *APICES, and STAMINA*.

PENDANTS of a Ship, are those long colours, or streamers, cut pointing towards the end, and there divided into two parts; hung out at the head of masts, or at the yard arm ends.

The pendants are chiefly used for show, though sometimes for distinction of squadrons, and for signals.

PENDANTS, (Rigging,) large, but short, ropes which go over the mast-heads with a splice, the ends hanging downwards, having an iron thimble, into which are hooked the main and fore-tackles. There are many other pendants, which are generally single or double ropes, with a block, or an iron thimble, spliced into their lower ends for tackles, all of which serve to transmit the effort of their tackles to some distant object: such are the bill-pendant, brace-pendants, preventer-brace-pendants, burton-pendants, fish-pendants, guy-pendants, main-stay-tackle-pendant, pendants of tackles, quarter-tackle-pendants, reef-tackle-pendants, rudder-pendants, stay-tackle-pendants, top-rope-pendants, truss-pendants, vang-pendants, winding-tackle-pendants, and yard tackle-pendants.

PENDARRYE, in Geography, a town of Hindoostan, in Oude; 17 miles N.W. of Kairabad.

PENDARTY, a town of Hindoostan, in the Carnatic; eight miles E. of Ongole.

PENDENNIS CASTLE, a fortress of England, in the county of Cornwall, situated at the mouth of Falmouth haven, built by Henry VIII., and fortified by queen Elizabeth. N. lat. $50^{\circ} 9'$. W. long. $5^{\circ} 1'$.

PENDENTIVE, in Architecture, the whole body of a vault, suspended out of the perpendicular of the walls, and bearing against the arc boutants.

Daviler defines it, a portion of a vault between the arches of a dome, usually enriched with sculpture: Felibien, the plane of the vault contained between the double arches, the forming arches, and the ogives.

The pendentives are usually of brick, or soft stone; and care must be taken, that the joints of the masonry be always laid level, and in right lines proceeding from the sweep whence the rise is taken.

The joints too must be made as small as possible, to save the necessity of filling them up with slips of wood, or of using much mortar.

PENDILHO, in Geography, a town of Portugal, in the province of Beira; 12 miles S.E. of Lamego.

PENDLETON, a township of Lancashire; 2 miles W. of Manchester.

PENDLETON, a county of Virginia, in America, bounded N.W. by Randolph, and S. by Rockingham, counties; watered by the S. branch of the Patowmack. It contains 3654 free inhabitants, and 124 slaves. Its chief town is Frankford.—Also, a district of South Carolina, on the Keowee and Savannah rivers; containing 20,050 inhabitants, of whom 2204 are slaves; 52 miles W. of Cambridge.—

Also, a county of Kentucky, containing 1573 people, of whom 239 are slaves.

PENDOUN, a town of Birmah; 12 miles S. of Raynangong.

PENDULOUS, *Hanging down*; a name which *Botanists* give to those heads of flowers which hang downwards; the stalk not being able to sustain them upright.

PENDULOUS *Roots*, such as are fixed to the ends of fibres, whence they seem to hang.

PENDULUM, in *Dynamics*, is a simple ponderous body, so suspended by a flexible cord from an axis of suspension, that it is at liberty to vibrate by the action of its own gravity alone, when it is once raised, by any external force, to the right or left of its quiescent position; and in demonstrating the theory of its motion, mathematicians are obliged to assume, that there is no rigidity in the cord; no friction at the axis of suspension; no resistance to motion opposed by the air; and no variation in the total length of the cord, arising from the variable temperature or moisture of the atmosphere; and if these assumptions were strictly correct, a pendulum, once put into motion, would continue to move *ad infinitum*, without the further accession of any external force; but when the pendulum is applied as the regulator of a clock, for which purpose it is admirably adapted, the assumptions we have named require an equal number of mechanical corrections, of which the theory, simply considered, takes no notice. In *Horology*, therefore, the pendulum must be considered, not simply as a self-moving pendulous body, without any tendency to come to a state of rest, or to have its dimensions altered by the circumstances in which it is placed; but as a body, whose motion is perpetuated by repeated accessions of force, in aid of its own gravity, and whose vibrations are rendered isochronal by a nice adaptation of mechanical contrivances, that prevent or remedy the prejudicial influences of all natural impediments to uniform and uninterrupted motion. It seemed necessary, in the first place, to establish the distinction that thus exists between the free or *detached* and *attached* pendulum; and having done this, which we must beg the reader to bear in mind, we propose to divide our article into three heads, namely, 1st, the history of the pendulum; 2dly, its theory in its *detached* state; and 3dly, its various constructions, when used in its *attached* state, as the regulator of an horological machine.

1. We have already given an historical account, under our article CLOCK, (see *History of the successive Improvements in Clocks*), of the first notice that was taken by Galileo of the vibrations of bodies suspended by long chains, and also of the application that was made soon after, by various persons, of the isochronal property of the detached pendulum, particularly in astronomy, as well as of its introduction, in its attached state, into horological machines as a regulator of their motions, after the balance had been applied for the same purpose: we beg leave, therefore, to refer the reader to the article already named, for the particulars that would have fallen under this head, had not this part of the subject been anticipated.

2. The second head of this article which we proposed to consider, was the theory of the simple pendulum vibrating in its detached state. When Galileo discovered that ponderous bodies, whether large or small, suspended by cords of equal length, perform their vibrations apparently in equal times, he was led into the contemplation of the laws of uniformly accelerated motion, produced by the constant force of gravity, and soon found that the theory of the detached pendulum was derivable from the same laws by

which bodies, left to descend in free space, were found to be accelerated, and that gravity was the sole cause of such acceleration. We have already treated of these laws at some length, under our articles ACCELERATION, DESCENT, and MOTION, which render unnecessary a repetition of this part of our subject, except so far as the vibration of the pendulum is concerned. It was, however, soon perceived, that a pendulum, vibrating in long arcs of a circle, requires a somewhat longer time for the performance of each of those vibrations, than when it vibrates in small arcs, all other circumstances remaining the same; it thence became a question among mathematicians what the nature of that curve might be, in which, substituted for the arc of a circle, both long and short vibrations would be performed in the same time. Though Galileo is acknowledged to have been the first who discovered and described the curve first called by him the cycloid, yet it remained for the celebrated Huygens to explain not only the isochronal property peculiar to this curve, but also that the involute of a cycloid is itself a cycloid, which latter discovery enabled him to make the attached pendulum actually vibrate in a cycloidal curve. Under our article CYCLOID we have given at considerable length both the geometrical and mechanical properties of this remarkable curve, which we recommend to the reader's notice, as preparatory to our doctrine of vibrations performed in cycloidal, and also in circular curves; for he will there see that short arcs of vibration, at each side of the lowest or quiescent point of the curve, are very nearly sinular, both as to coincidence in position, and also to the consequent isochronal property. He will see, not only that arcs of all lengths, when cycloidal, are performed in equal times, but that small circular arcs approximate so nearly to their correspondents in the cycloid, that they may be substituted in practice for each other, the former for the latter, without sensible deviation.

Prefuming, now, that our reader has made himself acquainted with the laws of uniformly accelerated motion, agreeably to our references, and that he has perused with attention also the article CYCLOID, we will proceed to lay before him the fluxional method of determining the actual times of a detached vibration both in *cycloidal* and in *circular arcs*. This part of our subject has been recently treated so ably by professor Bridge of the East India college, that we beg leave to avail ourselves of his labours, at the same time that we recommend to general notice his "Introduction to the Study of the Mathematical Principles of Natural Philosophy, 1813."

On the Times of Vibration in Cycloidal Arcs.—In *fig. 1. of Plate XXXIX. of Horology*, "let A V B be a cycloid, in which a body, P, suspended from the point S, performs its vibrations between the two *semi-cycloids* S A, S B, and let it begin its vibrations from the point E; also let P ρ be any very small arc, described in the descent from E to the lowest point V; draw E F, P N, ρn , parallel to the base, A B, of the cycloid, and join C M, C m, M V, m v. Let C V, the diameter of the generating circle, = d , F V = a , N V = x ; then F N = $a - x$, M V = $\sqrt{C V \times N V} = \sqrt{d x}$. Now the cycloidal arc P V being = twice the chord M V = $2 \sqrt{d x}$; let E P = z , then E V = $z + P V$; and since E V is a constant quantity, $z + P V = o, \therefore$

$z = -$ the fluxion of P V = $-\frac{\sqrt{d \cdot \dot{x}}}{\sqrt{x}}$. The velocity down E P (v) = the velocity down F N = $\sqrt{4 m \times F N} = \sqrt{\quad}$

PENDULUM.

$= \sqrt{4m \cdot a - x}$; if therefore $t =$ the time down EP, we shall have $i = \frac{\dot{z}}{v} = \frac{\sqrt{d \cdot \dot{x}}}{\sqrt{x}} \times \frac{1}{\sqrt{4m \cdot a - x}} = -\sqrt{\frac{d}{4m}} \times \sqrt{\frac{x}{ax - x^2}}$; and $t = -\sqrt{\frac{d}{4m}} \times$ circular arc, rad. $= 1$, ver. fin. $\frac{x}{\frac{1}{2}a} + \text{cor.}$; but when $t = 0$, $x = a$, $\therefore 0 = -\sqrt{\frac{d}{4m}} \times \text{cir. arc, rad.} = 1$, ver. fin. $= 2$, + cor. $= -\sqrt{\frac{d}{4m}} \times \text{femicircle, rad.} = 1$, + cor. $=$ (if $\pi = 3.1416$, &c.) $-\sqrt{\frac{d}{4m}} \times \pi + C$, or $C = \sqrt{\frac{d}{4m}} \times \pi$.

The fluent properly corrected therefore is $t = \sqrt{\frac{d}{4m}} \times \pi - \text{cir. arc, radius } 1$, verfed sine $\frac{x}{\frac{1}{2}a} =$ (when $x = 0$) $\sqrt{\frac{d}{4m}} \times \pi =$ the time of descent through the cycloidal arc EV; consequently the whole time of vibration $= \sqrt{\frac{d}{4m}} \times 2\pi = \sqrt{\frac{d}{m}} \times \pi$. Since the quantity a does not enter into this value of t , it is evident that the times of vibration will be the same, from whatever point of the cycloid the body P begins to vibrate. Moreover, since the time down the axis CV $= \sqrt{\frac{d}{m}}$, we have the time of a vibration : the time down the axis :: $\sqrt{\frac{d}{m}} \times \pi : \sqrt{\frac{d}{m}} :: \pi : 1$:: the circumference of a circle : its diameter; which conclusion coincides with our former determination under the article CYCLOID.

On the Times of Vibration in circular Arcs.—In fig. 2. of the same plate, “let the small body P, vibrating in the circular arc EVG, begin its vibrations from the point E; let PV = z , NV = x , FV = a , Pp = \dot{z} , SP or SV = r , then $\dot{z} = \frac{r \dot{x}}{\sqrt{2rx - x^2}}$. Let $t =$ the time through EP, $v =$ the velocity in the point P, then $v = \sqrt{4m \times FN} = \sqrt{4m \cdot a - x}$, and $t = \frac{-\dot{z}}{v} = \frac{-r \dot{x}}{\sqrt{2rx - x^2}} \times \frac{1}{\sqrt{4m \cdot a - x}} = -\frac{r}{\sqrt{4m}} \times \frac{\dot{x}}{\sqrt{ax - x^2}} \times \frac{1}{\sqrt{2r - x}}$ (for $\sqrt{2rx - x^2} = x \sqrt{2r - x}$), hence $t = -\frac{r}{\sqrt{4m}} \times \frac{\dot{x}}{\sqrt{ax - x^2}} \times \frac{1}{\sqrt{2r}} \times 1 + \frac{x}{4r} - \frac{3x}{32r^2}$ &c. by expanding $\frac{1}{\sqrt{2r - x}}$ into a series.

Again, let $\frac{\dot{x}}{\sqrt{ax - x^2}} = A$; then since $\sqrt{\frac{r}{4m}} \times$

$\frac{1}{\sqrt{2r}} = \sqrt{\frac{r}{8m}}$, we have $t = -\sqrt{\frac{r}{8m}} \times A + \frac{x}{4r} + \frac{3x^2}{32r^2} + \text{\&c.}$ Therefore, $t = -\sqrt{\frac{r}{8m}} \times A + \frac{aA - 2P}{8r} + \frac{9a^2A - 18aP - 12Q}{256r^2} + \text{\&c.}$ + cor. (where $P = \sqrt{ax - x^2}$, $Q = x \sqrt{ax - x^2}$, &c. &c.)

Now when $t = 0$, $x = a$, $\therefore P = 0$, $Q = 0$, &c.; and at the same time $A (= f' \frac{\dot{x}}{\sqrt{ax - x^2}} = \text{cir. arc, whose rad. is } 1, \text{ ver. fin. } \frac{x}{\frac{1}{2}a}) =$ a semi-circle whose radius is $1 = \pi$; hence $0 = -\sqrt{\frac{r}{8m}} \times \pi + \frac{a\pi}{8r} + \frac{9a^2\pi}{256r^2} + \text{\&c.} + \text{cor.}$ The fluent, therefore, when properly corrected, is $t = \sqrt{\frac{r}{8m}} \times \pi \times 1 + \frac{a}{8r} + \frac{9a^2}{256r^2} + \text{\&c.} - \sqrt{\frac{r}{8m}} \times A + \frac{aA - 2P}{8r} + \text{\&c.} =$

$\sqrt{\frac{r}{8m}} \times \pi \times 1 + \frac{a}{8r} + \frac{9a^2}{256r^2} + \text{\&c.}$ (when $x = 0$, and consequently, A, P, Q, &c. each = 0) for the time of descent down the arc EV; \therefore the whole time of one vibration $= \sqrt{\frac{r}{8m}} \times 2\pi \times 1 + \frac{a}{8r} + \frac{9a^2}{256r^2} + \text{\&c.}$

If the arcs be so very small, that the verfed sine, a , may be entirely rejected with respect to the radius r , then the time of a vibration $= \sqrt{\frac{r}{8m}} \times 2\pi =$ (if $r = 2d$)

$\sqrt{\frac{d}{4m}} \times 2\pi = \sqrt{\frac{d}{m}} \times \pi =$ the time of [a vibration in a cycloid whose axis is d or $\frac{1}{2}r$. The time of oscillation, therefore, in a very small circular arc, is the same as the time of oscillation in a cycloid, whose axis is equal to half the length of the cord by which the vibrating body is suspended, as was otherwise shewn to be the case under our article CYCLOID: for in these very small arcs, the time of descent

down EV $= \sqrt{\frac{r}{8m}} \times \pi$. Now the time down the chord $=$ the time down the diameter of a circle $= \sqrt{\frac{2r}{m}}$.

Hence the time down a very small circular arc : the time down the corresponding chord :: $\sqrt{8m} \times \pi : \sqrt{\frac{2r}{m}} :: \pi : \sqrt{\frac{1}{8}} : \sqrt{2} :: \pi : 4$:: the circumference of a circle : four of its diameters.

If the length of the arc through which the pendulum vibrates be such, that all the terms of the series except the

PENDULUM.

two first may be rejected, then the time of a vibration = $\sqrt{\frac{r}{8m}} \times 2\pi \times \sqrt{1 + \frac{a}{8r}}$; and, consequently, the time of a vibration in a circular arc (whose radius is r) : the time of a vibration in a cycloid (whose axis is $\frac{1}{2}r$) :: $1 + \frac{a}{8r}$: 1. For instance, let the arc of semi-vibration be 2° at each side of the lowest point, then $a = \text{versed sine of } 2^\circ = \frac{6r}{10000}$ nearly; $\therefore \frac{a}{8r} = \frac{1}{13333}$. In arcs which are less

than 2° , this difference will be still less; so that if the whole arc through which a pendulum vibrates does not exceed 4° , it may, without any material error, be considered as oscillating in a cycloid, and consequently all its oscillations will be performed in the same time, whether it vibrates in a greater or a lesser arc within this limit.

Lastly, let A = the arc, whose versed sine is a , then (supposing the arc to be very small) $a = \frac{A^2}{2r}$; and if n = the number of degrees in this arc, then $A : 2\pi r :: n : 360$, or $A = \frac{2\pi r n}{360}$. $\therefore a = \frac{A^2}{2r} = \frac{2\pi^2 r n^2}{360^2} =$ (for $\pi = 3.1416$, &c.) $\frac{r n^2}{6565}$ very nearly; hence $\frac{a}{8r} = \frac{n^2}{52520}$; consequently the variation for $N - n$ degrees is $\frac{N^2 - n^2}{52520}$; if therefore the pendulum keeps true time, when it oscillates through n degrees, the error arising from its vibrating through N degrees will be $\frac{N^2 - n^2}{52520}$ of the time of one vibration.

For instance, if a pendulum which vibrates 5^{e} seconds, keeps true time when it vibrates through an arc of 2° , on each side of the vertical line; then if it vibrates through an arc of 3° , it will lose $\frac{3^2 - 2^2}{52520} = \frac{5}{52520} = \frac{1}{10504}$ every

second, or $\frac{60 \times 60 \times 24}{10504} = 8''.2$ in a whole day. If the same pendulum be made to vibrate through an arc of $2^\circ 10'$ on each side of the vertical line, then it will lose only $\frac{2.16, \&c. - 2^2}{52520} = \frac{.665 \&c.}{52520}$ in a second, or $\frac{60 \times 60 \times 24 \times .665 \&c.}{52520}$, which is very nearly one second per day.

Nearly the same results will be the consequence of this still more simple process; viz. "Take $\frac{3}{4}$ of the difference of the squares of the arcs for the seconds, gained or lost by a decreased or increased arc;" thus $3^2 \times 3^0 - 2^0 \times 2^0 \times \frac{3}{4} = 7.5$ nearly as before.

When two pendulums of different lengths are made to vibrate in a detached state, at the same time, the times of their respective vibrations will be in the subduplicate ratio of their lengths: and the respective lengths of different pendulums, vibrating at the same time in similar arcs, will be in the duplicate ratio of the times of a vibration directly; or in the reciprocal duplicate ratio of the number of vibrations so made in any one and the same time. Let the length of a second's pendulum be taken in a given latitude at $39\frac{1}{2}$ inches = r , let g be $16\frac{1}{2}$ feet, or the space that a heavy body falls in free space

in the first second of time, and let $p = 3.1416$, &c. the diameter of a circle, whose radius is 1; then t , the time of vibration in a circular arc, being as $p \sqrt{\frac{r}{2g}}$, where p and g are constant or given, t will be as \sqrt{r} , and r as t^2 . Hence the length of a half-second's pendulum will be $\frac{1}{4}r$, or $\frac{39\frac{1}{2}}{4} = 9.781$ inches; and the length of a

quarter second's pendulum will be $\frac{39\frac{1}{2}}{16} = 2.445$ inches: and in this manner a table of square roots may be readily constructed of the various lengths of a pendulum, that are required to correspond to any number of seconds, or portions of a second, in each vibration.

The action of gravity, however, is not the same in all latitudes; nor yet at all heights above the earth's surface in the same latitude; for instance, the vibrations are slower at the equator than at the poles, and increase in quickness with the latitudes, north or south, as the centrifugal force decreases, and vice versa, the force of gravity being counteracted, in a certain degree, by the centrifugal force, which increases with the distance from the earth's axis of rotation, and the times of a vibration being reciprocally proportional to \sqrt{g} .

By an experiment made on the pendulum that vibrated seconds at Paris, Richter found that at the island Cayenna, 4° from the equator, it required to be shortened a line and a quarter, to perform a vibration in a second; and Mr. Campbell, in 1731, by an experiment made in Jamaica in 18° north latitude, determined that if a second's pendulum is 39.126 English inches long, agreeably to Graham's determination, the length at the equator would be required to be 39.00, and at the pole 39.206 inches. (Phil. Trans. N^o 432.) These experiments led Mr. Emerson to compute a table for the length of the pendulum to swing seconds for every five degrees of latitude, together with the length of a degree of latitude in each of those parallels, in English miles, which table we shall here subjoin.

Degrees of Lat.	Length of a Pendulum.	Length of a Degree.
	Inches.	Miles.
0	39.027	68.723
5	39.029	68.730
10	39.032	68.750
15	39.036	68.783
20	39.044	68.830
25	39.057	68.882
30	39.070	68.950
35	38.084	69.020
40	39.097	69.097
45	39.111	69.176
50	39.126	69.256
55	39.142	69.330
60	39.158	69.401
65	39.168	69.467
70	39.177	69.522
75	39.185	69.568
80	39.191	69.601
85	39.195	69.620
90	39.197	69.628

PENDULUM.

The numbers in this table of course suppose the pendulum vibrating close to the Earth's surface in each parallel of latitude.

Professor Bridge has also calculated a little table, on a supposition that the length of a seconds pendulum is 39.2 inches in latitude 52° , which is taken as his standard, and he has given the lengths corresponding not only to six different latitudes, but to four different heights, six at the Earth's surface, and at one, two, and three miles of elevation respectively. We shall take the liberty of giving this table also.

Latitude.	Length of Pendulum at the Earth's Surface.	One Mile above the Earth.	Two Miles above the Earth.	Three Miles above the Earth.
At the Equator	39.060	39.036	39.013	38.997
Lat. 30°	39.115	39.091	39.068	39.052
45	39.170	39.146	39.122	39.107
52	39.200	39.176	39.152	39.137
60	39.225	39.201	39.177	39.161
At the Pole	39.281	39.257	39.233	39.218

The greatest variation in the length of a pendulum vibrating at three miles above the equator, and on the Earth's surface at the pole, is only 0.284 of an inch, which affords but a small scale for determining either altitudes or the figure of the Earth, to both which purposes the observed variations in the lengths of the pendulum have been proposed as a measure.

When a pendulum of a given length has been observed to gain or lose a certain quantity daily, it is convenient, in making the adjustment for exact time, to have some concise theorem as a guide to bring it to the point desired, at one trial in all cases, which theorem professor Bridge has given in these words: "Multiply twice the length of the pendulum by the number of seconds gained or lost, and divide the result by the number of seconds in a day; the quotient will give the number of inches, or parts of an inch, by which the pendulum is to be lengthened or shortened." Suppose the gain of a seconds pendulum to be three minutes,

or $180''$ in a solar day, then $\frac{39.2 \times 2 \times 180''}{86400} = .163$ parts

of an inch, is the quantity, in this case, by which the pendulum must be lengthened to measure mean time; but if the three minutes had been lost with a half-seconds pendulum,

then $\frac{9.8 \times 2 \times 180}{86400} = .041$ of an inch, or the fourth

part of the former gain, will be the quantity by which the said pendulum will require to be shortened. This rule is not only short in its application, but easy to be remembered.

Under the title CYCLOID, we have shewn that if l be the length of a seconds pendulum, and π the periphery of a circle, or 3.1416, &c. the expression $\frac{\pi l}{2}$ will be the measure of the velocity of a falling body acquired in one second of time, and also that the expression $\frac{\pi^2 l}{2}$ will denote the space fallen through in a vertical line in the same time; if

we would apply these expressions to experiments in any given latitude, instead of the length of the pendulum determined in our own latitude, we must substitute the length given in one of the preceding tables, agreeably to the latitude proposed, and then the result arising from such length, as determined by the said expressions, will be corresponding; and the scale of acceleration will be accommodated to the increased or decreased force of gravity in that particular latitude; for instance, agreeably to Mr. Bridge's Table, the spaces fallen through in one second of time at the equator and at the pole will be respectively 192.663 and 193.753, the difference between which is only 1.09 inches; which is the greatest difference that exists between the spaces fallen through in one second on any two points of the Earth's surface.

If it should be required to know what the height of a mountain is, on which a seconds pendulum, that measured mean time truly at its base, lost a given quantity; let r = radius of the Earth, x = the height of the mountain, T = the number of seconds in an hour, or the number of vibrations in an hour at the base, and t = the seconds lost on the mountain; then $T - t$ will be the number of vibrations in an hour at the top of the mountain. When the length of the pendulum is given, it is known that the number of vibrations in a given time are directly as the square roots of the forces, which act upon the

pendulum; hence $T : T - t :: \sqrt{\frac{1}{r^2}} : \sqrt{\frac{1}{(r+x)^2}} ::$

$$\frac{1}{r} : \frac{1}{r+x} :: r+x : r, \therefore t : T - t :: x : r, \text{ or } x = \frac{tr}{T-t}.$$

If t be very small with respect to T , then x may be considered as equal to $\frac{tr}{T}$. Let T now be taken equal $3600''$,

and let t be taken successively at 1, 2, 3, &c. seconds, then x will be equal to $\frac{r}{3000}, \frac{2r}{3000}, \frac{3r}{3000}$, &c.; and supposing

r to be equal to 4000 miles, the heights of mountains upon which a pendulum, that vibrates seconds at their bases, loses 1, 2, 3, &c. seconds in an hour, will be $1\frac{1}{3}, 2\frac{2}{3}, 3\frac{1}{2}$, &c. miles respectively. Hence, if the pendulum should gain t seconds in an hour before it is carried up the mountain, and it should be required to find that point in the ascent, where it would keep true time, we have $T + t : T ::$

$r + x : r, \therefore t : T :: x : r, \text{ or } x = \frac{tr}{T}$; that is, if we

multiply the gain by the Earth's radius, and divide the product by the number of vibrations performed in the hour, the quotient will be the height of that part of the mountain, where the pendulum must be fixed to keep true time.

Hitherto we have considered the matter that constitutes the whole pendulum as collected into one point, and that the centres of gravity and of oscillation coincide in that point, which cannot be strictly the case with any shape of the bob, however slender the cord, wire, or rod of suspension. For instance, if a small ball of lead, or other ponderous body, were suspended by a silken thread; suppose the ball to be divided into two equal semi-balls by a horizontal line, as it is suspended by the vertical thread, then the lower semi-ball would move with a greater velocity than the upper one, though vibrating together, in consequence of its greater radius of motion, consequently the momentum of the lower semi-ball

PENDULUM.

femi-ball would exceed that of the upper one, and considering the two femi-balls as again united, it is clear that the common point of *oscillation* will be somewhere in the lower femi-ball, though the centre of gravity is in the middle of the line of division, even if the silk thread be assumed as having no sensible weight. As we have given the methods of determining the centres both of *gravity* and of *oscillation* of bodies of different figures, with much minuteness, under our article *CENTER*, it is not necessary to pursue this part of our subject here, but to beg of the reader to recollect that the centre of *gravity* of any single pendulum is always *above* the centre of its *oscillation*, and that the distance from the point of *suspension* to the centre of *oscillation* is always to be taken as the *true length* of the pendulum, however suspended, or whatever may be the shape or size of the bob or ball. This observation is indeed equally true, however complex the construction of the pendulum may be, for we have shewn, (see *CENTER*.) that whatever be the number of particles of matter composing a pendulum, the products of the particles lying at one side of the centre of oscillation, when multiplied both by their respective distances from the point of suspension, and also from the centre of oscillation, will make an amount, always equal to the amount of the products obtained from the particles so multiplied, lying at the other side of the centre of oscillation, without regard to shape or size. In a common seconds pendulum of 39.2 inches length, with a heavy lenticular bob, and a slender verge or rod of suspension, the centre of *gravity* is very nearly $\frac{1}{10}$ th of an inch above the centre of *oscillation*; and in all our preceding deductions the length of the pendulum must be considered as measured from the point of suspension at the vertex, to the centre of oscillation.

But we have seen a pendulum so applied for the regulation of a portable clock, that the point of suspension was not at the vertex, but in a point somewhere between the vertex and the centre of gravity; by which application, the centres of gravity and of oscillation were farther removed from each other, than they would have been with the point of suspension at the vertex. A pendulum of this description, of a short length, may be made to vibrate in times of different lengths, which will depend on the respective distances between the centres of gravity and of oscillation; but the scale of adjustment for time being very short, and liable to be altered by variable temperature, this construction may be considered as an object of curiosity rather than of utility. If it were required, however, to find the distance between the centre of oscillation and point of suspension in any pendulum of this sort, where the *time of vibration* is given, it may be thus determined: Let T be the time given, L = length of a simple or common pendulum that will vibrate in that time, $\pi = 3.1416$, $m = 16\frac{1}{2}$ feet, and F = the force

of gravity constantly acting; then since $T = \sqrt{\frac{\pi^2 L}{2 m F}}$,

we shall have $L = \frac{2 m F T^2}{\pi^2}$ for the distance from the point

of suspension to the centre of oscillation. Again, in *fig. 3, Plate XXXIX. of Horology*, let Aa be a solid uniform rod, and G its centre of gravity; then if A be taken as the point of suspension in the vertex, the centre of oscillation will be at O , at two-thirds of its length from A . But let S be put as the point of suspension below A , then $L = SG + \frac{AG \times GO}{SG}$. Let $SG = x$, $AG = D$, $GO = d$;

then $L = x + \frac{Dd}{x}$, or $x^2 - Lx + Dd = 0$, from which

$$x = \frac{L \pm \sqrt{L^2 - 4 D d}}{2}; \text{ substitute } \frac{2 m F T^2}{\pi^2} \text{ for } L \text{ in}$$

this equation, and it determines the distance of the point (S) of suspension to (G) the centre of gravity of the rod; through which point (S), if the axis of suspension be made to pass, the rod will vibrate in the *given time*. But as x has two values, it seems that there are two points at different distances from G , the centre of gravity; from which if the rod be suspended, it will oscillate in the given time. By similar reasoning it may be proved, that the rod will vibrate in the *least possible time*, when SG is a mean proportional between AG and GO ; likewise, that if o be the centre of oscillation to the point of suspension S , the point, G , of the centre of gravity will be in the middle between S and o ; and, lastly, that a rod so circumstanced will vibrate in the least time possible, when its point of suspension, S , is $\frac{2}{3}$ of the whole length of the rod from its vertex A .

3. We come, in the third and last place, to treat of the various constructions of the attached pendulum, when used as the regulator of an horological machine, as we at first proposed. It has been usual, when treating of the pendulum, to call what we have denominated the free or *detached* pendulum, vibrating by the action of its own gravity alone, the *simple* pendulum; and what we call the *attached* pendulum, where external force is introduced in aid of gravity, the *compound* pendulum. But as the attached pendulum is constructed sometimes with a *simple* rod or verge, and sometimes with a *compound* one, we propose to apply these two terms, *simple* and *compound*, exclusively to the different constructions of the attached pendulum, agreeably to the significations in which they are used by clock-makers.

In writing the article *ESCAPEMENT*, which is that portion of a clock that transmits the maintaining power, in a modified way, to the pendulum, we found it necessary to explain at some length, how the natural scale of forces, arising from gravity alone, is disturbed by the accession of any external force, such as is derived from the maintaining power; and by a reference to *figs. 1. and 2. of Plate XXXI. of Escapements*, we proved that this scale is most deranged, when the external force is applied at the extremity of the arc of excursion; and least, at the lowest point of the said arc. We also shewed how to estimate, in any point of the arc, both the force applied at that point, and the velocity with which the pendulum is moving there; as well as determined the total arc corresponding to the maximum of velocity, and other particulars of essential importance both in the theory and practice of clock-making. We must, therefore, request the reader to consult our introduction to the article *ESCAPEMENT*, so far as it relates to the *pendulum*, before he proceeds to peruse the remainder of our present article. Indeed, the different parts of a clock are so intimately and mutually connected, that the action of one frequently cannot be clearly explained, without at least a partial explanation of the properties of the other; which is the reason why we have anticipated several particulars relating to the motion of the pendulum, before we arrived at our present article.

Of the simple Pendulum in Horology.—When a pendulum was first applied to be the regulator of a clock, the crown-wheel escapement was used with it by Huygens, and the pendulum was necessarily made to vibrate in long arcs; but it was soon found that it had at least three defects: 1st, the maintaining power acted on the wheel, and consequently on the pendulum, by means of the fork, almost constantly, thereby producing an alternate acceleration and retardation of motion beyond what gravity alone would produce; 2dly, the times of vibration in the longest arcs were found

PENDULUM.

to be slower than in the shortest arcs, in the proportion of about 34 to 29; and, 3dly, the verge of the pendulum itself was found to have its total length increased or decreased by variations of atmospheric temperature. Hence arose the necessity of new escapements, and of different modifications of the pendulum, to make it act as an uniform regulator of mean time under all circumstances. As we have had occasion to describe different pendulums, and also the parts connected with them, such as the fork that gives it motion, the cock by which it is suspended, the spring of suspension, the verge, the bob, and screw of adjustment, &c. (see *CLOCK*, and *CLOCK-MAKING*;) a repetition of what we have before said would be superfluous. We will, therefore, take it for granted that every one, that has seen an ordinary clock with a seconds pendulum, which, with Dr. Hooke's anchor escapement, is called the *royal pendulum*, knows its parts and construction. The true length between the centre of oscillation and axis of suspension of any pendulum is best ascertained by adjustment for rate, first, from hour to hour roughly, and then from day to day, either by the going of a good clock already adjusted, or by a transit of one of the heavenly bodies. (See *CHRONOMETER*, prob. vii, viii, and ix.) But from what we have said under our article *ESCAPEMENT*, it will be seen that the length of any pendulum will require to be a trifle more or less, accordingly as the *external impulse*, derived from the maintaining power, is great or small, permanent or temporary, gradual or instantaneous; or, which is to the same effect, accordingly as the escapement has a *recoil*, is of the *dead-beat* sort, is *detached*, or has a *remontoire*. When, therefore, we speak of the acting length of a pendulum, we must always have a reference to both the quantity and quality of the auxiliary force that perpetuates its motion. In ordinary cases, an additional force applied in aid of gravity accelerates the pendulum, and requires a compensation by adjustment, as will be seen presently, for additional length. This adjustment was made by Huygens, by a small ball moving along the verge above the bob, but is generally effected by a tapped nut at the inferior end. This method is, however, inconvenient, inasmuch as that it requires the pendulum to be stopped; for which reason, in many regulators, or astronomical clocks, the adjustment for rate is made at the superior end, above the cock. For the shape and size of the bob of a given pendulum, we must refer to our term *BOB*, in its proper place, where we have entered into a minute detail of the particulars relating to its shape and size, with a given maintaining power and escapement, both which must be considered at the same time; but further experiments are perhaps wanting, in this department of horology, to determine the best possible combination of all the requisite agents in a moving pendulum, including the suspension. The metal of which the verge is usually composed is iron or steel; but their expansion by heat, and contraction in cold, render them improper substances for an accurate pendulum: for, in the extremes of temperature, the rate will alter by an iron pendulum more than 20" in the 24 hours. Straight-grained deal or sapadillo, well seasoned, is better for the verge than metal; though these, and indeed all sorts of wood, are subject to changes, from moisture, if not from heat, and therefore cannot be entirely depended on, in all seasons of the year, where great accuracy is required.

From what we have here had occasion to state respecting the motion of an attached pendulum, it will be evident to our readers, that our deductions with respect to the exact length of the *detached* one, where the *accelerative force* was considered constant and uniform, will not be strictly accurate when that force is *variable*, which it is more or less in its

attached state: we will therefore conclude our remarks on the *simple* attached pendulum, by shewing in what degree the length of such pendulum is affected by any accelerative force. Whatever this force (*F*) may be, the time of a body's falling down half the length of the pendulum, by the laws

of acceleration, will be $\left(= \sqrt{\frac{S}{m F}} \right) = \sqrt{\frac{L}{2 m F}}$,

where $m = 16\frac{1}{2}$ feet, and $L =$ the length of the pendulum,

and $\pi = 3.1416$; therefore $T \cdot \sqrt{\frac{L}{2 m F}} :: \pi : 1$, or T

$= \sqrt{\frac{\pi^2 L}{2 m F}}$, which *varies* as $\sqrt{\frac{L}{F}}$. Consequently,

the times of vibration of pendulums of *different lengths*, acted upon by *different accelerative forces*, will vary as the *square roots* of the *lengths* directly, and the *square roots* of the *forces*

inversely. If L be given, then $T \propto \frac{1}{\sqrt{F}}$; that is, the

times of vibration of pendulums of the *same length* vary inversely as the *square roots* of the *accelerative forces*; and if T be given, then $L \propto F$; namely, the lengths of pendulums vibrating in the *same time* vary as the *forces* which *accelerate* them.

The accelerative force, added to the natural force of gravity in a clock, is usually called the *maintaining power*, and may be derived either from an appended weight immediately through the escapement, or from a spring or springs wound up by a weight at short intervals; and in either case the quantity and mode of its action will be limited by the nature of the escapement adopted; and frequently the spring of suspension is so tapered upwards or downwards, as to become a modifier of the maintaining power, in conjunction with the escapement, all which circumstances must be taken into the account when the nature and quantity of the extraneous force is estimated.

Before we conclude our account of the simple pendulum, we will just mention that such pendulum vibrating in a given time, in a given situation on the Earth's surface, has been proposed as a perpetual standard of linear measure. Hatton, we understand, first proposed this subject for the consideration of the Society of Arts at the Adelphi buildings, (vol. i.) and Mr. Whitehurst took up the subject after him, and contrived a method of ascertaining the difference between the lengths of a seconds and half-seconds pendulum, by means of an apparatus, which afterwards came into the possession of Dr. George Fordyce, who improved it, by adding a compensation to the pendulum, and gave an account of it, with drawings, in the Philosophical Transactions of London, of the year 1794.

We may also mention here, that Huygens, in his "*Horologium Oscillatorium*," proposed a *circular* or *circulating pendulum*, to move in the concave side of a parabolic conoid, the circuits of which would be performed, he says, in equal times, when the mechanism is properly adjusted; but it would lead us beyond our mark in this place, to pursue this part of the subject further. See *Horol. Oscil.*

Of compound or compensating Pendulums.—If any substance, sufficiently long for a pendulum, could be found in nature, that has not its dimensions enlarged or diminished by heat or cold, such substance would be the most suitable for a simple attached pendulum; but all attempts to discover such a substance have hitherto been ineffectual. (See *EXPANSION*.) Hence different contrivances have been devised by ingenious

PENDULUM.

men, to counteract the effects of variable temperature in the pendulum, and some of them have succeeded in effecting this desirable purpose. So long ago as the year 1648, the different expansibilities of various metals was known by Wendelin to exist, and in 1715 that ingenious artist George Graham made several experiments with the pyrometer, invented by Musschenbroek, to ascertain the relative quantities of expansions of different metals, with a view of availing himself of the difference of the expansions of some two or more metals, when opposed to each other, in the construction of a compensating pendulum, but the difference which he detected, between iron and brass, for instance, was so small, that he relinquished all hope of being able to accomplish his object in this way, and therefore gave up the project. (Phil. Trans. London, 1726.) However, it occurred to the same artist, that mercury was affected by changes of heat and cold sufficiently to answer the purpose of keeping the centre of oscillation of a pendulum always equidistant from the point of suspension, provided the mercury could be made to ascend while the verge of the pendulum descended, or elongated, by any degree of heat; and *vice versa*. In 1721 the trial was made in a pendulum, which we shall presently describe, and in which the compensation, after some adjustment, was found so complete, that its error in the extremes of temperature was reduced to $\frac{1}{4}$ th of the quantity observable in an ordinary simple pendulum. In the mean time, the idea of arranging metallic bars of different expansibilities in such a manner, as to constitute a good compensating pendulum, being once suggested by Graham's paper on the subject, roused the ingenuity of different mechanics, and Harrison, a carpenter of Barton in Lincolnshire, in the year 1726, succeeded in completing the requisite arrangement. His rods of metal were placed in such parallel situations as to resemble those of a grid-iron, from which circumstance the pendulum, so constructed, has been denominated the *grid-iron pendulum*. Since Harrison's time, there have been various modifications of the compensating pendulums, both in England and France, the principal of which we shall describe in their order of time, but none of them have been found to excel the prototypes of Graham and Harrison, which are still used, one or other of them, in the principal observatories. If any improvement has been made on the original pendulums, it is in the external appearance, and in the easier modes of adjustment.

Graham's Mercurial Pendulum.—Graham's mercurial pendulum, which may be considered as the first compensating pendulum, is represented in *fig. 4, of Plate XXXIX. of Horology*; A B is the verge consisting of a rod of steel, carrying at its lower extremity a stirrup, B C, of the same metal, holding the glass cylindrical vessel, E F, on a circular plate, surrounded by a rim, to keep the vessel from falling out; this vessel was filled with pure mercury up to the letter F, near the top; and above there was space enough to receive more, in case the compensation should not prove on trial to be sufficient. The sliding piece of metal, D, was adjustable to any part of the verge, for fixing the rate of going, and the compensation could be made more or less by adding to or deducting from the mercury. It does not appear certain, whether the glass vessel was chosen by conjecture, as to its size and shape, or was calculated previously, from a consideration of the relative expansibility and absolute specific gravity of mercury; but we are disposed to think, that it must have been from calculation, because it very much resembles the vessel calculated by Mr. Lowe of Islington, for the mercurial pendulum recently made for the Royal Observatory of Greenwich, by Hardy. In this pendulum, as now made by Hardy, and others, the lower end of the verge

is tapped, and descends through the top of the stirrup where a milled and divided nut screws on, by means of which the adjustment for rate is made, without the sliding piece D, which is now rejected. One peculiarity of this pendulum is, that the mercury which is used as the means of compensation, constitutes also the weight of the bob. We are not made acquainted with the quantity of mercury used by Graham; nor yet with the particulars of Mr. Lowe's calculation; but the vessel which the latter determined, as the most suitable, was cylindrical, seven inches and a half long within, and two inches in diameter, exclusively of the thickness of the glass, which was one-eighth of an inch; the capacity proposed was for twelve pounds, but by eliminating the solid contents of such a vessel, and trying its bulk of mercury, from a table of specific gravities, we find that it will not hold more than ten pounds of this fluid, if so much. The depth to which Hardy's vessel was proposed to be filled was $6\frac{7}{8}$ inches, but on trial at the Royal Observatory, it was found necessary to add $\frac{1}{8}$ th more, and $6\frac{9}{10}$ inches are now found to compensate the steel verge so admirably, that the greatest deviation in the rate, during winter and summer, has never yet exceeded $\frac{1}{100}$ ths of a second *per day*. The escapement that acts with Hardy's pendulum is of the remontoire sort, acting almost constantly on the pendulum, and therefore requiring it to be somewhat longer than an exact standard.

Harrison's Grid-iron Pendulum.—Though we have given a general description of Harrison's grid-iron pendulum, as made by Reid of Edinburgh, under the article *CLOCK*, (see *Astronomical Clock by Mr. Thos. Reid of Edinburgh*) to which we refer our readers, as well as to *Plate XXII. of Horology*, where it is represented; yet we feel it due to that ingenious artist, to resume our observations on his contrivance in this place. When Harrison had determined the relative expansions of steel and brass to be very nearly as 3 to 5, it is probable that he reasoned on the subject in some such way as this; let a rod of steel be suspended by its upper end on a fixed point, and let it hang freely in a vertical position, then to the lower end rivet the lower end of a brass rod, so as to ascend parallel and contiguous to the iron rod, while it is supported by the rivet; if the iron rod be divided into five equal portions, and the brass rod be made just equal to three of those portions, what will be the consequence? Why the tops of the two rods will always preserve the same distance from each other, because the downward expansion of the longer iron rod will always be equal to the upward expansion of the shorter brass rod, consequently, if the vertex of the iron rod be made stationary, by being fixed to a wall or otherwise, the vertex of the brass rod will also be stationary as it respects the other. Let now the vertex of the iron rod be assumed as the point of a pendulum's suspension, and let the vertex of the brass rod be the place for the centre of oscillation, then the centre of oscillation of a single rod, or of any number of similar rods, of uniform metal, is at $\frac{2}{3}$ ds of the length from the point of suspension; but the common centre of oscillation will be still lower in a compound pendulum that has another rod, not of the same length attached to its lower end; therefore two rods so united cannot produce a proper compensation, and at the same time have the immovable point at the common centre of oscillation. But the rods may be cut into any number of lengths that the due arrangement may require; we have seen that if the long iron rod be cut in two between the second and third portion, we shall have three lengths, one of iron $\frac{2}{3}$ ths of the long rod, one of brass $\frac{2}{3}$ ths, and another of iron $\frac{1}{3}$ ths, or equal to the one of brass; in every arrangement of the various lengths to form a compound pendulum,

PENDULUM.

the rods of least expansion must necessarily expand downwards, and those of greater expansion must expand upwards, because these rods will be fewer in number, and the difference of the total expansions must compensate the lack of the combination, by which the ball is suspended; accordingly the length of the verge must be $\frac{2}{3}$ ths of the longer rod, and the other two each $\frac{1}{3}$ ths; but $\frac{1}{3}$ ths is $\frac{1}{4}$ d longer than the required pendulum; this arrangement therefore in a seconds pendulum is inconvenient, making the pendulum too long: let the iron rod then have three lengths and the brass rod two, so that there may be two pairs of equal length and one to spare for the verge, to be compensated by the surplus of expansion of the brass over the iron equal pairs of rods; this division in due proportions will make a pendulum of the requisite length, and will also preserve the centre of oscillation unchanged as it regards the axis of suspension; but there is yet an inconvenience to be surmounted; the two pairs of alternate iron and brass rods are to be united at both their extremities, each to the next contiguous rod, first below and then above, till they are all attached to each other, and the ball of the pendulum must in this case be suspended by the *extreme* rod, which will therefore make the vertical line fall diagonally across the parallel rods, and pull them to a distance from each other; but to prevent this evil the ball must hang from the *middle rod*, and also the rods must be braced to prevent their flying out; these requisites may be effected by employing two pairs more of similar iron and brass rods, at the opposite side of the fifth or spare iron rod, that carries the ball, for these additional pairs of bars will not otherwise affect the compensation, than do the same thing over again which the others did without them; and they will thus constitute a counterpoise by their weight, afford the means of a longer horizontal bracing piece, and preserve the coincidence of the vertical line with the middle rod at the quiescent position. Thus *nine* rods became necessary to constitute the grid-iron pendulum; and when they are well proportioned and nicely fitted into the holes of the connecting pieces, so as not to touch one another, nor to have friction in the holes, the pendulum completely answers its purpose in all variations of temperature, and may be brought to time, like the simple pendulum, by a screw of adjustment either at the cock of suspension under the ball, or at the point of oscillation. But the proportions of the alternate rods may not produce the exact compensation; that is, the pendulum may be either over-compensated or under-compensated; the adjustment for compensation, when that is necessary, is usually made by altering the position of one of the horizontal connecting pieces of brass, by taking out the pins and inserting them again into other holes, drilled in some of the bars to answer this purpose. This adjustment, however, is troublesome, as it cannot be made without detaching the pendulum, and putting it probably out of its rate of going; and this inconvenience constitutes one of the principal objections to this construction of the pendulum, for which there appears to be no remedy yet devised. For the construction of a grid-iron pendulum rods, drawn into wire, are preferable to square rods, both on account of their having less friction, and of their being more exposed to the air, when not quite in contact. In Harrison's pamphlet, published in 1763, it is stated that one of his clocks did not deviate from its rate, as measured by his grid-iron pendulum, more than one second in a month, for ten years together; and Berthoud has expressed his regret that all the particulars of Harrison's construction of a clock, have not been divulged, that the public may benefit from his contrivances. It should seem that notwithstanding the objections that have been

made to the cycloidal cheeks, Harrison, while unacquainted with Huygens's invention, introduced the use of them into at least one of his clocks. But their excellence did not consist of this addition. About the year 1798 the composer of this article saw, in a back lane at Lincoln, and purchased one of Harrison's clocks, which he recollects had wheels and pinions of hard wood; and that the teeth of the pinions were cylindrical rollers turning loosely on as many pins of steel: but he could not examine the escapement. The old woman, who was the possessor, was a lineal descendant from Harrison, and some of her wife neighbours persuaded her, that if she parted with Harrison's clock, his *ghost would haunt her*, which suggestion made such an impression on the good woman's spirits, that she begged she might be allowed to retain her clock; which request was accordingly granted.

Regnauld's Pendulum.—In the year 1733, Regnauld, a clock-maker of Chalons in France, contrived a metallic pendulum of brass and steel, the expansions of which were opposed to each other in such a way, that they constituted a *partial* compensation. This pendulum is represented by *fig. 5.* of the same plate that contains Graham's mercurial pendulum, and probably derived its origin from the experiments mentioned in his paper on the Philosophical Transactions of London of the year 1726. The pendulum in question was made before Harrison's account was published; it was composed of three parallel rods, two of steel and one of brass; the middle rod was of steel, and carried the horizontal cross-piece E A attached to its lower extremity; one end of this cross-piece supported the brass rod A B, to the top of which, at B, was rivetted the horizontal pin which passes through an oblong hole in the middle rod; the third rod, D E, which was of steel, was suspended by the pin B, and carried the bob L, attached to it by a tapped nut of adjustment for rate beneath: the whole pendulum must have been suspended by the top of the middle rod. The action is thus; while the middle rod elongates downward by increased heat, the brass rod of greater expansibility, A B, elongates upwards, and carries with it the pin B, by which the third rod D E is suspended; and this rod passing through the cross-piece E A, again elongates as much as its fellow, or rod A B of the same metal; therefore the compensation is effected on a supposition that one rod of brass will compensate two of steel, or that brass expands double the quantity of steel with the same degree of heat, and also contracts in the same ratio, neither of which assumptions is true. The relative expansions being in fact as 17 to 10, according to Berthoud, or, according to others, as 113 to 68, or very nearly as 5 to 3.

Deparcieux's Improvement of Regnauld's Pendulum.—In the year 1739, Deparcieux, a teacher of mathematics, and a distinguished member of the Academy of Sciences at Paris, examined the construction of Regnauld's pendulum, and proposed an improvement in its construction, which rendered it capable of adjustment for compensation as well as for time. This pendulum is given in *fig. 6.* of the same plate, and may be thus described: A R P and E F are two bars of steel passing through the perforated piece of metal S T, which forms a clamping-piece to hold them in their places; C D is a bar of brass resting with its inferior end on the toe, F, of the bar E F, so as to be supported by it. Q R is another clamping-piece, fast either at Q or R to one of the steel bars, but so adjusted, that the other two may not be restrained from passing without friction whenever they elongate. Through the clamping-piece, S T, passes a slit lever resting at the end S, as a centre of motion, in a notch, or otherwise made moveable round a fixed

PENDULUM.

pin, in the clamping-piece; this lever has a triangular point resting on the top of the brafs bar CD in such a way, that it is at liberty to ascend with the bar whenever it elongates; at the other end of the said lever the rod AR is suspended, which therefore has more or less motion upwards produced by the expansion of CD, accordingly as the triangular point on the lever is nearer to S, the centre of motion, or T, the point of the third bar's suspension: for when the rod EF elongates, the rod of brafs CD elongates more in the proportion of 17 to 10, and the surplus 7 acts on bar AR, and, by the aid of the lever, compensates it.

This pendulum was afterwards still further improved by Berthoud, who made the triangular point of bearing in the lever adjustable for distance from the centre of motion, by a screw that acted on it, and altered its situation a little. (See *Essai sur l'Horlogerie*, tome ii. p. 123.) Berthoud ascertained the relative expansions of several different metals by a pyrometer that indicated the $\frac{1}{360}$ th part of a French line, and according to his experiments, made the 17th of March 1760, when he was contriving the alteration in Deparcieux's improved pendulum, the following Table was constructed; in which the verge was taken at 3 feet 2 inches and 5 lines French, or 461 lines, in each experiment.

Berthoud's Table of Metallic Expansions.

A verge of soft steel	-	-	$\frac{40}{360}$	of a line.
— of steel hammered cold	-	-	$\frac{74}{360}$	of ditto.
— of spring-tempered steel	-	-	$\frac{77}{360}$	of ditto.
— of soft iron	-	-	$\frac{75}{360}$	of ditto.
— of hardened iron	-	-	$\frac{78}{360}$	of ditto.
— of copper	-	-	$\frac{107}{360}$	of ditto.
— of brafs	-	-	$\frac{121}{360}$	of ditto.
— of tin	-	-	$\frac{160}{360}$	of ditto.
— of lead	-	-	$\frac{193}{360}$	of ditto.
— of glafs	-	-	$\frac{62}{360}$	of ditto.
— of silver	-	-	$\frac{119}{360}$	of ditto.
— of gold softened	-	-	$\frac{92}{360}$	of ditto.
— of gold in hard wire	-	-	$\frac{94}{360}$	of ditto.
— of mercury	-	-	$\frac{1235}{3600}$	of ditto.

In this table the whole fraction of each metal gives its absolute expansion, and the numerators the relative expansions, as the denominator is common to all. These experiments were first made with simple rods, and again with 35 pounds suspended to each, without any variation in the expansions, though it appeared that the subsequent contractions were not exactly corresponding when the weight was suspended and when there was no weight; and it is to be regretted, that the author did not repeat his observations on the comparative contractions under different circumstances, as he has done the comparative expansions, in order that the results might have been ascertained as they relate to the pendulum's verge stretched by a weight; for in all the experiments we have reported under our article EXPANSION, the subsequent contractions are considered as being exactly proportional to the expansions in the same degrees of opposite temperature. In composing a pendulum of rods of any two of these metals, it is perhaps unnecessary to remark, that the rods of each metal must have their total lengths in an inverse ratio of their expansibilities, unless indeed some mechanical advantage by a lever, or otherwise, be given in aid of the difference of the absolute expansions, as is done in the instance before us.

Deparcieux's Compensation of a Simple Pendulum.—In the

same year in which Deparcieux contrived an improvement of Regnauld's pendulum, he invented a compound compensation frame to be substituted for the common cock of suspension, without altering the simple pendulum, which mechanism comes next to be described.

This contrivance is represented by *fig. 7*, of our last named plate, where ABDF is a steel bar bent into the shape of a two-pronged fork with the ends pointing upwards, and fixed to a solid wall at the points A and F. GEIH is another fork, formed smaller, of brafs, and is inverted, or made to stand with its ends resting on the horizontal part, BD, of the outer, or steel fork. The horizontal, or upper part, EI, of the brafs fork, constitutes the cock of suspension, and has a squared hole in the middle, which just admits the tapped wire K, from which the suspension-spring depends; in order that the nut of this tapped wire may give the adjustment for time. Underneath this cross-piece of the fork of brafs is a detached cock, not shewn, near C, which has a slit cut through it in the direction of the vertical line of the spring of suspension, through which the spring passes without play, and from the under side of which the length of the pendulum is reckoned. This cock of limitation is screwed to the frame of the wheel-work, and therefore remains unmoved. It is easy to see, in this disposition of the bars of steel and copper, that if the expansions of those two metals be as 10 to 17, the length of the steel verge of the pendulum added to the length, AB, of the outer fork, must be to EG, the length of the inner fork above, as 17 to 10, to make the compensation complete; and accordingly the length of the brafs fork was made $54\frac{2}{3}$ French inches, the sum of the other two being very nearly 93.

About the same time that this pendulum was made, Cassini proposed some different constructions, some with three, and some with five rods, steel and brafs alternately, in the pendulum itself, which he gave in a memoir in the *History of the Academy of Sciences at Paris* in the year 1741.

Compensating Tube and Rod of Julien le Roy, applied to the Simple Pendulum.—According to Thiout, Julien le Roy contrived a mode of compensating the simple pendulum in the same year as Deparcieux, above stated, and on the same principle, though the compensating mechanism of Le Roy was altogether above the pendulum. This contrivance, exhibited in *fig. 8*, of the same plate, consists of a vertical brafs tube, 42 French inches long, denoted by the letters *abcd*, resting at its lower end on AB, the cock of suspension, which is also the cock of limitation of the pendulum's length, by having a slit made in it just large enough to admit the spring of suspension without play, which spring hangs from the lower end of a steel rod, attached to the top part or cap, *a b*, of the brafs tube; therefore, in this construction also, the sum of the steel rods, *i. e.* of the verge of the pendulum, including its spring, and of that included in the tube, should be to the tube alone as 17 to 10. Thiout has given the length of the tube only at 42 inches, but Berthoud has remarked, that it either is, or ought to be, $54\frac{2}{3}$, like the brafs fork of Deparcieux. A pendulum of Le Roy's construction was spoken well of in Cassini's *Memoir of 1741*, and was adopted in the observatory of Cluny about 1748, after which time the clock, to which it was applied, was spoken of with great eulogium.

The principal objections that, we conceive, apply to either of these two last pendulums, are, that the spring of suspension is constantly altering its length and strength; that the slit in the cock of limitation must have the effect

PENDULUM.

of lengthening the pendulum in proportion to the play that the spring has in it, to the right and left of the vertical line, as the pendulum is vibrating; and that the pendulum rod in motion will cool sooner than the compensating parts remaining at rest.

Ellicott's Compensating Pendulum.—We have stated under our article EXPANSION, that Ellicott, of London, made very accurate experiments on the relative expansions of seven different metals, which, on a comparison, we find to differ, more or less, from Berthoud's table, as well as from the determinations of Smeaton, Ramsden, Julien le Roy, Borda, and others; so that when a compensation pendulum is constructed of any description, it seems proper, that the relative expansions of the metal used should not be taken from any table of results, but from an examination of the identical materials of which the pendulum is to be constructed, and that after tempering, hammering, filing, polishing, &c. in order to gain the due proportions in their state as prepared for use. Ellicott, we doubt not, used this precaution, and his experiments were made, most probably, with a view to the construction of the pendulum we are now going to describe. It had been objected to Harrison's grid-iron pendulum, that the adjustment of the rods for temperature was inconvenient, and accompanied by a considerable change in the rate, and that the expansion of the ball supported at its lower edge was all in an upward direction, to avoid which objections, as well as the supposed jerks during the elongation, was probably Ellicott's object, at the time of his contriving a new pendulum: whether or not he had seen the application of the lever in Deparcieux's pendulum is not certain, but his contrivance is nearly allied to that, the principal difference being that in Ellicott's pendulum two levers are adopted instead of one, and are applied at the bob instead of the superior end of the verge. In describing Ellicott's pendulum we shall avail ourselves of the inventor's own account, and then subjoin our own remarks. *Fig. 1, of Plate XL. of Horology,* represents the pendulum; in which *ab* is a bar of brass made quite fast at the upper end by pins, and held contiguous at several equal distances, by the screws 1, 2, &c. to the rod of the pendulum, which is a bar of iron; and, so far as the brass bar reaches, is filed of the same size and shape, though it does not appear so in the figure, but, a little below the end of the brass, the iron is left broader, as at *dd*, for the conveniency of fixing the work to it, and is made of a sufficient length to pass quite through the ball of the pendulum to *c*. The holes 1, 2, &c. in the brass, through which the screws pass into the iron rod of the pendulum, are filed, as in the drawing, of a sufficient length to suffer the brass to contract and dilate freely by heat and cold under the heads of the screws: *ecce* represent the ball of the pendulum; *f, f*, two strong pieces of steel, or levers, whose inner centres, or pivots, turn in two holes drilled in the broad part of the pendulum rod, and their outer ones in a strong bridge, or cock, screwed upon the same part of the rod, but omitted in the figure, to shew the mechanism: *g, g*, are two screws entering at the edges, and reaching into the cavity near the centre of the ball. The ends of the screws next the centre are turned into the form seen in the figure, which, pressing with the weight of the ball against the longer arms of the levers, cause the short ends to press against the brass bar at *b*. Things being in this situation, let us suppose that the rod of the pendulum, and the brass annexed to it grow longer by heat, and that the brass lengthens more than the iron of the same length; then the brass, by the excess of its dilation, will press the short ends of the levers downwards at *b*, and at the same time necessarily lift

up the ball, which rests on the long ends of the same lever, at *ff*, to any proportion necessary for due compensations. The calculated proportion of the short arms of the levers must be to the long ones, as the excess in the expansion of brass is to that of the whole length of iron; and if this calculation be found on trial not perfectly accurate, the slide screws *g, g*, will produce the exact compensation at a few adjustments. At *ik*, the inferior end of the iron verge, a strong double spring is fixed to bear the major part of the ball's weight, by its pressure upwards against two points of the ball, equidistant from the vertical line. This is the description of the first pendulum made in this way, and the only alteration that the inventor made afterwards was placing the slide screws in the body of the ball.

Cumming, after describing this pendulum in his *Elements of Clock and Watch-work*, proposes that the brass bar should elongate between two iron bars, in order to keep it straight, and to prevent the jerks to which he conceives Ellicott's construction is still liable, from friction impeding the free elongation of the brass bar, and from a consequent tendency to curvature before each jerk: he has also proposed to alter the structure of the short arms of the levers, by making them turn each on an axis of motion, and to change their places of pressure mutually, in order that their united action may be applied in the same point, at the centre of the brass bar, in direct opposition to the line of downward expansion; and we entertain no doubt but that the proposed alterations, once adopted, would be found to be real improvements in Ellicott's pendulum. See Cumming's *Elements*, page 106, and plate xi.

Rhomboidal Pendulum.—Mr. Hooke proposed to make a compensating pendulum of rods of steel and brass arranged into the form of a rhombus, or rhomboid, the four sides of which were of steel and the long diagonal of brass: this construction, requiring the pendulum to be broader than long, was found to be very inconvenient, and was therefore never applied to a clock. But the principle was afterwards taken up by a clock-maker at Ulverston in Lancashire, named Williamson, or Williams, who, about the time that Ellicott constructed his pendulum, made several pendulums, not however of one rhombus each, but of five united by joints at the angular points, opposed to the diagonals of brass; so that as the brass elongated more than the steel, the angles opened and kept the diagonals always at the same distance from the said angular points, and from each other. Mr. Edward Troughton also, without knowing what had been done by Williamson in this way, contrived and made a pendulum similar to his in all respects, except that seven rhombi were adopted instead of five, which narrowed the pendulum still more than Williamson's construction, and which answered its intended purpose very well. We believe this construction is very little known at the present day, and, therefore, we beg leave to give a sketch of its arrangement in *fig. 2. of Plate XL.*, which will be sufficiently understood from inspection. We have not calculated the proportions necessary for the sides and common bases of the triangles which compose these rhombi, so that the compensation may be complete; but any one competent to construct this pendulum will easily ascertain by calculation the due proportions.

Compensating Pendulum of F. Berthoud by Frames.—When Berthoud had finished his experiments on the relative expansions of metals in 1760, which was three years before Harrison had published his pamphlet relating to his pendulum, he contrived a compound pendulum, much resembling Harrison's grid-iron at the first appearance, and which is constructed to answer the same purpose. He had previously noticed

PENDULUM.

noticed that Deparcieux's improvement of Regnault's pendulum, and also his own, where the lever was introduced, were not calculated to support a heavy pendulum with steadiness; he therefore employed his mind in contriving one, by which any weight might be suspended, that might be found desirable to move in small arcs. This pendulum, or rather a sketch of it, is contained in *fig. 3. of Plate XL.*, in which the oblong frame, surrounding the other parts, and denoted by the letters *a, b, c, d*, is of steel; the upper end of which carries the knife edge suspension at *s*; *e f g h* is a second frame, open at the top, and made of brass; the horizontal portion, *e f*, rests on the interior part of the lower end of the steel frame above the ball; the upper ends do not reach the whole length of the surrounding frame, but allow another frame of steel, *i n m n*, to rest on them, by means of their chin-pieces, at their upper extremities; again, *o* and *p* are two rods of brass resting on the inferior part of the horizontal connecting piece, *i n*, of the second steel frame, and at their upper ends support a single steel rod, with a chin at each side, which rod descends in the middle of the pendulum, and holds on its lower end the ball, after it has passed through holes made in the three frames above described. In this construction, as in Harrison's, it is easy to see, that the difference of the ascending expansions of the brass frame and rods, and of the descending expansions of the steel frames and middle rod, constitutes the compensation for the effects of variable temperature; and if the sum of the lengths of steel are to the sum of the lengths of brass inversely as their expansions, the compensation will be perfect.

For the particulars relating to the suspension, and metallic thermometer of a pendulum, made agreeably to this arrangement, we beg to refer our readers to Berthoud's own account, and to the corresponding engravings. See *fig. 1. of plate 28. of Essai sur l'Horlogerie*, and *fig. 1. of plate 10. Histoire de la Mesure du Temps*.

Troughton's Mercurial Pendulum—When Graham's mercurial pendulum had been many years in use, and had performed in the most satisfactory manner, some prejudices were without reason raised against it, originating more in fancy than from experience, and Mr. Edward Troughton, about the year 1790, with a view of doing away the most material prejudice, contrived a modification of the mercurial pendulum, which may be considered as a distinct pendulum, inasmuch as that the materials are differently arranged both as to quantity, quality, and situation. An idea prevailed that the metallic rod of Graham, and the vessel of mercury, would not be affected by changes of temperature in a contemporaneous manner, but that the mercury being below the rod, and having on that account a quicker motion, would cool sooner than the metallic rod, and be moreover liable to more frequent changes from its greater susceptibility, notwithstanding the testimony of a long trial to the contrary; Mr. E. Troughton therefore substituted a strong glass tube with a bulb at the lower extremity, to be filled to a certain height with mercury, which should rise and fall precisely as in a thermometer, which instrument, in fact, his tube is; and to make it useful as such, it carries a graduated scale. The tube in question is about the size of a barometer tube, and the bulb large enough to contain 45 ounces of pure mercury, by the aid of one-half the tube. *Fig. 4. of Plate XL.* will explain Mr. Troughton's arrangement more clearly than a mere verbal description. *A B* is the mercurial rod filled with mercury to the middle point of the rod; at *A* the suspension is similar to that described in Messrs. Brockbank's astronomical clock, (see *CLOCK*,) where Troughton's tubular pendulum is described, with a reference to *Plates XXIII. and XXVII.*: *C D* is the bulb guarded by the surrounding

lenticular bob of brass and lead made in the usual way, except that it is made hollow at the centre; the metallic parts of the pendulum weigh about nine pounds exclusively of the mercury; the rim that surrounds the bulb, and by which the weight of the lenticular bob is supported, projects into two notches cut in the interior edges of the metallic lens, at each side of the cavity, and the nice fitting of the bulb to its rim, renders the glass capable of bearing the weight of metal supported by it. The compensation of this pendulum is effected entirely by the ascent and descent, alternately, of the mercury up and down the glass tube as the heat varies, and as the expansion of glass is much less than that of any of the metals, the small column of mercury contained in the tube is found sufficient to answer its purpose completely, after a trial of more than twenty years. Indeed this pendulum has proved itself equal, if not superior, to any of its predecessors, and the difficulty of the construction is perhaps the only objection why it is not more generally adopted, particularly in situations where there is no risk of carriage. We cannot dismiss our account of this pendulum, of which fort only a small number has been constructed, and of which no account has been before publicly given, without mentioning a curious property in it, known only perhaps to the contriver and to the writer of this account, which is, that if the column of mercury be made to reach either above or below the middle of the pendulum, at a mean temperature, the pendulum in either case will be *under-compensated*; but when the column reaches to the *middle exactly*, at a mean temperature, the compensation is *exact*; that is, the compensation has the greatest effect when the column reaches to the middle of the pendulum, which the inventor, we understand, foresaw would be the case, and calculated his dimensions accordingly.

Dr. G. Fordyce's Compensation of the Simple Pendulum, and others of a similar Construction.—The compensation described in the Philosophical Transactions of 1794, as the invention of Dr. G. Fordyce, is not attached to the pendulum, but to the cock of suspension, in this respect like that of Deparcieux, contrived in 1739, from which it probably was borrowed. The original pendulum of Dr. Fordyce, as altered from Whitehurst's, is now in the possession of Gen. Bentham, from which an universal standard of linear measure was attempted to be taken, and from which, as a model, some few others have been made. In *fig. 5.* of our last plate, let *A B* represent the back of the clock case, to which a tube of brass may be attached at its lower end, of such length as to compensate the verge of the pendulum, which is a long slender spring. Near the top of this tube is a bracing piece, *C*, in form of a clamping tube, through which it passes without play or friction, and by which it is kept fast to the back of the case. The upper end, *A*, carries the cock of suspension and a counterpoise to the pendulum, and under it is fixed fast to the clock frame a second cock of limitation, for the spring of suspension to be received in, and by which the effective length of the pendulum is limited. (For a minute account of this apparatus, see Nicholson's Journal, 4to. ed. vol. iii. p. 20.) The theory of this pendulum is, that as the fixed tube behind the clock case lengthens by expansion in heat, the steel pendulum, though more expanded, will be shortened in the same proportion by the upward motion of its spring and cock of suspension above the cock of limitation; and if the wood of the clock case were unalterable by heat or moisture, this theory would be a good one, but as it takes no notice of the material to which the fixed rod is attached at its lower end, the actual compensation amounts to no more than the difference between the expansion of metal and wood gives;

PENDULUM.

or in other words, it does no more so circumstanced than a wooden pendulum would do applied in the common way. But inaccurate as the compensation we have described must necessarily be, where the compensation tube is relying on another body not taken into the account; yet Mr. John Crothwaite of Dublin has described a pendulum of his invention, in the Transactions of the Royal Irish Academy, as being a superior pendulum, which differs in no respect from Dr. Fordyce's, except that the fixed rod of compensation is sold as well as the verge, and is supported by a bracket carried by a large piece of marble, and like Whitehurst's clock, has cycloidal cheeks near its spring of suspension. Likewise the Rev. J. Pine of Eastdown, near Barnstaple in Devonshire, has described in the 3d vol. of the Repository of Arts, &c. a pendulum similar in all respects to Mr. Crothwaite's, except that the cycloidal cheeks are omitted, and *spiral springs* applied to raise and lower the cock of suspension as the rod of compensation directs, which must be less steady than the original method of Dr. Fordyce.

Berthoud has described a method of compensating a simple pendulum in his "Histoire de la Mesure du Temps," tome ii. p. 84, fig. 2. plate 11, which is not liable to the same objection as the preceding ones; for he has not allowed any substance to be a part of his mechanism, if it is his own that he describes, but what is taken into the account; a frame of three bars, the middle one of steel, and the two extreme ones of brass, all fastened at the bottom to a cross piece, and the brass ones also at their tops to another cross piece, constitutes the compensation in question; the upper cross piece, or end of the frame, is fixed to the back plate of the frame that holds the wheels, and consequently the brass rods elongate downwards, while the single steel rod elongates upwards in a smaller quantity; it is not however fast to the cross piece, but passes through it, and carries a pin acting against one end of a double lever, that has its centre of motion on the cock of suspension, while the other end of the double lever bears the pendulum. The consequence is, that while the brass rods lengthen downwards, they take the steel rod with them as far as is equal to the difference of their respective expansions, and the contiguous end of the lever, which has a counterpoise for the pendulum, falls with it, and lifts the pendulum verge at the remote end of the double lever the requisite quantity for compensation of the simple rod: and this quantity is determined by an adjusting screw, altering the centre of motion between the two opposite ends of the double lever. This construction seems to possess all the requisites of a good compensation, except that the frame is not in motion.

Troughton's Tubular Pendulum of different Metals.—We have already described two pendulums of Troughton's contrivance, both of which answered their purpose of being good regulators, and hence it may be matter of surprise, why the same man should contrive a third, very different in its construction from either of the former. But pendulums which may be equally good regulators of a clock, when properly adjusted, are not equally capable of ready adjustment, particularly for variations of temperature, after they are brought to a mean time. All the pendulums which we have hitherto described required their adjustments for temperature to be made from a trial of their going in summer and winter, and eight or nine months waiting between each adjustment was an interval inconveniently long for an astronomer, who was anxious to pursue his observations; Mr. Troughton therefore, whose numerous contrivances are generally so many improvements in the mechanical arts, converted the grid-iron pendulum into a tubular one, which has all the accuracy of the old pendulum, and at the same time

all the simplicity of the external shape of the simple pendulum. This pendulum has its compensation examined, and its compensating mechanism adjusted by means of the inventor's new spirit-level pyrometer, without any trial for rate in the opposite extremes of temperature, and that as soon as it has been roughly adjusted to mean time. This saving of time, and of a repetition of adjustments, is a great improvement in the art of clock-making, and when generally known and adopted will enable the maker to send home his machine perfectly adjusted in the short space of a few days, whereas the old method of adjusting for temperature, from observations repeated at distant intervals, required as many months, and in some cases even years. Our *Plate XXVII. of Horology*, exhibits a variety of figures illustrative of the arrangement of the different parts of Troughton's tubular pendulum, and in our description of *An Astronomical Clock with Troughton's Pendulum*, under the head *CLOCK*, a minute account is given of the construction, to which our readers are desired to revert. It is asserted in the British Encyclopedia, that Finny of Liverpool, and Chandler of Seven Dials, London, both constructed tubular pendulums, very similar to Troughton's, many years before 1804, which is the date of Mr. Troughton's publication of his, in Nicholson's Journal; but as the arrangement of the two metals is not the same as in Troughton's construction, nor was known to him previously, this circumstance, if true, does not detract from his merit, as it regards the invention in question. Indeed we happen to know, that no tubular pendulum is at present, nor ever was, at the Richmond observatory, formerly superintended by M. de Mainbray, as stated in the article above referred to.

Ward's Compensation Pendulum.—In March of the year 1806, Mr. Henry Ward, of Blandford in Dorsetshire, communicated to the Society of Arts at the Adelphi, an account of a new compensation pendulum, accompanied by a model, which gained him the silver medal from the society. This pendulum consisted of three bars, two of iron and one of zinc, arranged in a manner very similar to Deparcieux's improvement of Regnault's old French pendulum, but without the lever of adjustment. The representation is given in *fig. 6.* of our last plate, where *bb* and *ii* are two flat rods of iron or steel, about half an inch wide and an eighth of an inch thick each; and *kk* is a rod of zinc, of nearly a quarter of an inch thick, interposed; the two extreme iron rods are cranked, one at the top to receive the suspension spring, and the other at the bottom to hold the ball in the same vertical line with the zinc rod. These three parallel rods are united by four screws, *l, l, l, l*, which passing through oblong holes in the bars *bb* and *kk*, screw into the rod *ii*, while the rod, *bb*, is fastened to the zinc one, *kk*, by the single screw *m*, near its lower extremity, which screw is the screw of adjustment for temperature, and requires several holes to be made in the bar *bb*, and also in *kk*, that the length of the zinc bar may be limited to its due proportion for exact compensation. The iron bar, *ii*, rests by a chin-piece on the upper end of the zinc bar, and therefore the ball supported by its lower tapped end stretches all the bars equally. If the zinc bar had rested on the crank at the bottom of the bar *bb*, instead of being held by the screw *m*, the arrangement would have been the same as in Deparcieux's, but with zinc substituted for brass, which consequently does not require the aid of a lever to increase its effect. The proportional expansions of zinc and iron were taken for this pendulum from Smeaton's table in the 48th vol. of the Phil. Trans. of London, and were made for hammered zinc as 373 : 151; but subsequent observations on the rate of the clock, to which the pendulum was applied, proved

PENDULUM.

proved that the expansion of the hammered zinc was greater than Smeaton's table gives it, though the quantity was within the reach of the adjustment.

In Nichol'son's Journal, 8vo edit. (vol. vii. page 300.) there is a notice of a similar pendulum by Benzenberg, where one rod of lead is introduced to compensate two rods of iron, but no drawing is given. For the original see Voigt's Magazine, vol. iv. page 787.

Compensation Pendulum by Adam Reid.—Another compensation pendulum, made by Mr. Adam Reid of Woolwich, was presented to the Society of Arts in April 1809, and the inventor was rewarded with fifteen guineas for his contrivance and model. This pendulum is given in *fig. 7.* of our last plate, and has its compensation of a tube of zinc acting on the ball from the lower end of the steel verge thus; A B is the steel verge, made a little thicker where it enters the ball C, and also of a lozenge shape, to prevent the ball's turning, but above and below it is cylindrical; near the centre of the ball is a shoulder in the verge, against which the upper end of the zinc tube D presses the cross piece of the ball when the nut E is turned up close to its lower extremity, but when the nut is turned back, in adjusting for rate, the tube descends a little, and the ball with it, while it rests on the upper extremity of the tube. When the compensation is too much, the tube may be shortened till it is found of the exact length, by a trial of the rate in extremes of temperature. In the figure before us the length of the zinc tube does not appear sufficiently long to compensate an entire verge of steel. The inventor observes that platina might be substituted for steel, and steel for zinc, for the formation of this kind of pendulum, but that the expense would be enhanced by the dearth of platina.

Doughty's Compensation Pendulum.—Mr. Thomas Doughty, of Charles-street, Somers-town, favoured us, in January 1811, with a sketch and short description of a compensation pendulum invented by him on the principle of flexure, by a compound bar that is applied to draw up the pendulum's ball in hot weather, after the manner of Mr. W. Nichol'son's, which we shall notice presently. *Fig. 8.* of the same plate to which we have lately referred, represents this pendulum in its reduced state; A is a compound bar of steel and brass foldered together, with the steel uppermost; the length of which is ten inches, the breadth half an inch, and thickness four-tenths; the steel portion being $\frac{1}{8}$ th of the whole; it is curved with the concave face downwards, the point E above the ball being the centre of curvature. Above this bar, and connected with it at the middle, rises the brass bar B, six inches long, to which the spring of suspension is fast, and which receives the impulse from the crutch at the point 8. C, C, are two similar sliding heads of brass, tapped to receive each a screw and saddle-piece to fix them in any given part of the compound bar: by means of two clock springs these heads are attached to the side rods D, D, of steel, each $\frac{1}{4}$ th of an inch wide, and $\frac{1}{8}$ th thick, which rods are again attached to the iron flat piece E by similar springs, while the flat piece passes through the ball and receives the nut of adjustment for rate. The compensation is effected thus; while the brass piece B, and the steel side rods D, D, elongate by heat, the curve of the compound bar, A, becomes more and more approaching towards a straight line, by the superior expansion of the brass portion, and this alteration of figure lifts up the ball of the pendulum a corresponding quantity; which quantity is regulated by the distance of the heads C, C, from the middle of the compound bar; the greater distance being always accompanied by a greater effect of the compensation,

and *vice versa*; but in making this adjustment care must be taken that the clock be not put out of beat, by moving one head more than the other; but if the clock is already out of beat, this adjustment may be used also as an adjustment for beat, at the time of adjusting for temperature. The springs are used for the purpose of preventing friction during the variations of temperature, but we suspect that there will be another consequence, not so favourable to the regular motion of the pendulum as might be wished; which is, that when the impulse is given from the maintaining power at the point 8 of the brass bar B, the springs, both near C C and E, will *yield*, or bend a little, before the heavy ball will be urged, and thereby require a greater power to keep the pendulum in motion than would be necessary without such springs; and also the ball and the rods will not begin and end their vibrations exactly in a contemporaneous manner, which circumstance, without very nice equipoise of the side rods, will produce a vacillation in the ball. Ritchie's pendulum, however, which follows, and which was intended to remedy the faults of this, is liable to the same objection, though his sliding adjustment for temperature will not interfere with the adjustment for rate, as must be the case with the pendulum before us; for bringing the upper ends C, C, of Doughty's side rods nearer together lengthens the effective length of the pendulum, thereby requiring a new adjustment for rate. The inventor heated a small room with steam till the adjustment for temperature was found complete, which turned out to require eight out of the ten inches of the compound bar to make this adjustment perfect.

Ritchie's Compensation Pendulum, and Nichol'son's.—In March of the year 1812, Mr. David Ritchie, of Clerkenwell, laid before the Adelphi Society, also, a model of a compensation pendulum, for which he received, as a reward, twenty guineas. The compensation in this pendulum was effected by means of the flexure of two compound horizontal bars interposed between the verge and the ball, which, like Doughty's, act on the same principle as the compound bars in the ordinary compensation balances of a chronometer. *Fig. 9.* represents the pendulum at present before us, in which A is the spring of suspension, B the ball, and C the steel verge as usual, with the nut of adjustment for rate at E, below the ball. The compensating bars are F and G, the upper part of F and the lower part of G being steel, and the other parts brass; so that any additional heat may bring the bars nearer together by the convexity of the brass faces of the compound bars being contiguous. These compound bars have each a sliding piece above and below *e* and *f* respectively, by the sliding of which the bars may have their effective lengths altered, in the adjustment for temperature; and are connected by the slender springs *e* and *f*, which bear a portion of the ball's weight; the remainder being borne by the springs *l* and *m* attached by screws at *b*, one to the verge piece *d* and the other to the ball piece *b*, while they themselves are united by screws at *l* and *m*. The compensation frame, so constructed, is adjusted by sliding the compound bars, before they are fixed, till the centre of the ball falls in the vertical line of the verge, where the screws at *b* fix it for trial. The impression on our mind, from a contemplation of this construction, is, that when the crutch of the clock urges the verge, the ball will not move with it till the springs *e* and *f* are bent a little, for when the ball is heavy, as is now customary in seconds pendulums, its weight will place a great stress on the slender springs that connect it with the verge, and produce, probably, a vacillation, as in Doughty's, that must be very unfavourable to isochronism,

isochronism, even allowing the compensation to be perfect. It was to avoid this evil, that Mr. Nicholson placed a similar compensation bar on the cock of suspension above the verge of his pendulum, and also above the cock of limitation, as seen in *fig.* 10. but without any spring, and in this situation the varying curvature of the horizontal compound bar, E E, altering the length of the suspension spring, produced the alternate rising and falling of the ball, as the verge carried it in an opposite direction, so that the centre of oscillation was comparatively stationary. (See *Phil. Journal*, vol. i. 4to. ed. plate 5. *fig.* 3.) The alteration in the length and strength of the spring of suspension is, however, an objection to Nicholson's construction. The same author also contrived a compensation pendulum composed of four rods of steel and one of a compound, or alloy, of zinc and silver, which is described in vol. ii. of his 4to. *Phil. Journal*. (See page 205, and plate 9.) But as there are eight figures necessary to explain the fittings of the different parts, and as the work is in every one's hands, we will satisfy ourselves by referring our readers to the author's own description.

Hardy's Compensation Pendulum.—Mr. Hardy of Clerkenwell, whose ingenuity and good workmanship have given him a high rank among chronometer makers, has lately contrived a compensation pendulum that partakes partly of the grid-iron class, and partly of Ellicott's, and that promises to be exempted from the jerks that have been imputed to the other constructions during the elongations and flexure of the bars. It was our intention to have given a drawing of this pendulum, but our plates of pendulums are full; and as the pendulum before us has not yet been applied to a clock, we will consider it as a project rather than as an approved pendulum. It is, however, completely finished. It consists of five parallel bars, the three middle ones of steel, and the two extreme ones of brass; there are two cross pieces at top, and as many at bottom, to connect the longitudinal bars, and the lowest carries a pair of small levers, on the remote ends of which the brass bars act as they elongate downwards, but the centres of their motions are springs, like those in the inventor's compensation balance, which balance performs very well; the ball is attached to the interior ends of the said levers by other springs, and a spiral spring acts near the top of the middle steel lever to carry a part of the ball's weight, in order to let the springs near the ball act without having too much stress on them. The excellence or defect of this pendulum must be proved by future trials.

Recapitulation of the principal Properties of a Pendulum.—As the various properties of, and circumstances relating to, the pendulum, have been treated of under different heads in this work, we will conclude our present account by recapitulating the principal of them in a succinct manner, thereby condensing the substance that is necessarily diffused over our work into regular order and a narrow compass.

1. The theory of a pendulum's motion is derived from the uniformly accelerative force of the gravity of its bob, considered as having all its weight concentrated into one point.

2. If such bob could be made to descend down the chord of its semi-arc of vibration, and to ascend up the chord of the other half, its long and short semi-vibrations would be performed in the same time, namely, in the time that would be taken up in falling through half the length of the pendulum, and the velocity at the lowest point would be as the length of the chord.

3. A pendulum cannot be made to move in the chords of

a circle, but will necessarily move in the arcs when suspended by a cord or rod.

4. The longer arcs of vibration require more time than the shorter ones, when those arcs are circular.

5. In that peculiar curve called a *cycloid*, or by the French a *roulette*, a semi-vibration is performed in the same time, whatever be the length of the arc, namely, in the time that would be taken up in descending down the chord of a corresponding arc of the generating circle.

6. The axis of a cycloid is equal to the diameter of the generating circle; the straight line passed over in the generation is equal to the circumference; and the whole cycloid equal to twice the circumference of the said circle.

7. The time of a semi-vibration in a cycloidal arc is to the time of the bob's descent down the axis of the cycloid, as a *quadrant* of a circle is to its *radius*; therefore the time of a whole cycloidal vibration is to the time of the fall down the axis as a *semi-circle* is to *radius*; or as the *circumference* of a circle is to its *diameter*.

8. The involute of a cycloid is itself a cycloid in every respect similar to the cycloid evolved.

9. Any cycloidal arc is equal to *twice* the corresponding chord of the generating circle; and therefore the axis of the generating circle is equal to half the arc of the whole semi-cycloid; hence a cord representing the length of a pendulum, evolved from contact with a semi-cycloid, till it rests at the vertex, must be *double* the length of the axis of the generating circle, and will move in a semi-cycloid.

10. Therefore the time of a pendulum's vibrating in a cycloidal curve is to the time of its bob's descent down *one-half* of its length, as the circumference of a circle is to its diameter.

11. Hence Huygens placed two portions of separate semi-cycloids, with their curves opposed to each other, and with their vertices nearly in contact at the point of suspension, that the thread of suspension might be evolved, first from one, and then from the other alternately, in each semi-vibration, in order to make all the vibrations, of whatever length, isochronal.

12. The theory of this contrivance was admirable; but it supposed the action of the pendulum's gravity to be sufficient to maintain the continuance of the vibrations, as well as all the ponderous matter collected into one point; likewise the centre of oscillation to be in the same point with all lengths of the cycloidal cord; and also the cord itself to be invariable in length, as well as perfectly free from rigidity; all which suppositions, not founded in nature, proved so many impediments to the practical adoption of the cycloidal checks for an *attached* or going pendulum, where external force is necessarily superadded to that of gravity, and where the centre of oscillation does not coincide with the centre of gravity.

13. But *small circular arcs* are so nearly coincident with cycloidal arcs near the vertical line, or line of quiescence, that they may be substituted for the latter, where they do not exceed 4° , without sensible error.

14. Hence the time of a vibration in *small circular arcs*, is to the time of the bob's falling down half the pendulum's length, *very nearly* as the circumference of a circle is to its diameter, which, in cycloidal arcs, has been shewn to be exactly so.

15. An escapement for *short arcs*, therefore, became necessary, when the cycloidal checks were laid aside, which acted with the *crown-wheel* escapement (an escapement adapted for long arcs), and Clement or Hooke contrived the *anchor-escapement*, which gave the pendulum,

vibrating in short arcs, the name of the *royal pendulum*, from the noble property it possesses as a regulator. [Query, was not the sign of the *crown* and *anchor* of horological origin?]

16. As the momentum of a pendulum is composed partly of ponderous matter, and partly of velocity, the reduction of the arc of vibration produced a necessary addition to the weight of the bob.

17. The times of vibration of pendulums of different lengths will be always directly to each other as the *square roots* of their respective lengths, where the accelerative force is constant and unaltered.

18. When pendulums of the *same length* vibrate with *different forces*, the times will vary inversely as the *square roots* of the *accelerative forces*.

19. The lengths of pendulums, vibrating in the *same times*, vary directly as the *forces* which accelerate them.

20. The times of vibration of pendulums of *different lengths*, acted upon by *different accelerative forces*, will vary as the square roots of the *lengths* directly, and the square roots of the *forces* inversely.

21. Hence the same pendulum will not vibrate in precisely the same time in all latitudes, where the force of gravity varies.

22. Nor will an attached pendulum, continuing to vibrate by the aid of some external force added to gravity, vibrate, even in the same latitude, in the same time as a detached pendulum vibrating by the force of gravity alone for a limited period.

23. Pendulums acting with different escapements, or having otherwise different maintaining powers, will therefore vary a little in their *lengths*, though they measure the same time, and even move in the same arcs.

24. External force, from the maintaining power, may be added to gravity, either instantly or gradually, for a longer or a shorter time, uniformly or variably, and commencing or ceasing to act at any given point of the vibration; or it may be applied to act in conjunction with gravity during the whole vibration; all which modes will require so many corresponding lengths of pendulum to vibrate in the same time.

25. Hence originated all the variety of escapements that act with the pendulum, and modify the maintaining power, by giving their impulses differently, as to place, quantity, quality, and duration.

26. That mode of giving the impulse is best, which either deranges the action of gravity least, or acts most in conformity with it.

27. When the same pendulum is by any cause made to vibrate in *different arcs*, the daily error, or difference, in seconds of time, will be $\frac{1}{108000}$ ths of the difference of the squares of those arcs, reckoned in degrees and parts of a degree.

28. A vibrating pendulum may have its arcs altered, not only by a variation in the additional force, or maintaining power, but may be so attracted by a contiguous heavy body, particularly if homogeneous, that its arc of vibration may be either enlarged or diminished by the position of the said body: if placed near the line of quiescence, the arc may be shortened; but if placed beyond the extremity of the arc, it may be enlarged.

29. If the point of suspension be not firmly and immovably fixed, a slight motion in it will have the same effect on the time, as lengthening the pendulum, though the maintaining power be the same; and if the points of suspension of two pendulums be contiguous, and be attached

to the same shelf or yielding substance, they will continue to vibrate *together*, though they are not exactly of the same length, nor adjusted precisely to the same time. *This curious property is observable in either the detached or attached pendulums.

30. When the pendulum is taken as an universal standard of *linear measure*, as well as of time, the experiments to ascertain the exact length of a seconds, or half-seconds pendulum, must be made always in the same latitude, on the same level, and in a detached state if possible, or otherwise the result will be affected by all or several of the variety of circumstances, which we have had occasion to consider as influencing the length of the vibrating pendulum.

31. That compensation-pendulum may be accounted the best, that changes its rate least throughout the year, provided that its adjustments can be conveniently made.

PENDULUM *Level*. See LEVEL.

PENDULUM *Watch*. See WATCH.

PENEDON, in *Geography*, a town of Portugal, in the province of Beira; 19 miles N.E. of Viseu.

PENELLA, a town of Portugal, in the province of Beira; 15 miles S.E. of Coimbra.

PENELOPE, in *Mythology*, the mother of *Pan* (see his article) by the god Mercury. She was the daughter of Icarus, who lived at Athens in the time of Pandion II., and had offers of marriage from several princes of Greece. Her father, to prevent quarrels that might have happened, obliged them to contend for her in the games, which he caused them to celebrate. Ulysses was the conqueror, and gained the lady for his prize. (Pausan. in Lacon.) After this marriage had been solemnized, Icarus used his utmost efforts to prevail with his son-in-law to stay with him at Sparta, where he was settled; and despairing of being able to persuade him, he conjured his daughter not to forsake him. Ulysses, tired with these importunities, referred the matter to the determination of his wife, leaving her at liberty either to accompany him to Ithaca, or to remain with her father. Penelope blushed at this speech, and answered only by covering her face with a veil. Icarus, understanding this dumb language, consented to her going with her husband; but moved by her graceful confusion, consecrated a statue to "Modesty," on the spot where Penelope had put a veil over her face. Penelope has been always considered as the most perfect model of conjugal love; but Bayle and some other authors have ridiculed the idea of her having been made a model of chastity, when it is alleged, that she suffered herself to be debauched by some of her lovers, who were always about her during the absence of her husband, and that she was expelled by him from Ithaca, whence she repaired first to Sparta, and afterwards to Mantinea, where she ended her days.

PENELOPE, in *Ornithology*, a genus of birds of the order Gallinæ. The generic character is this; bill naked at the base; head covered with feathers; clun naked; tail with twelve feathers; legs without spurs. There are four

Species.

CRISTATA, or Guan. Head with an erect crest, temples violet. It inhabits Brasil and Guiana, and is about 30 inches long. It is frequently tamed, and its flesh is reckoned very delicate. It utters a sound something like the word Jacu. The other characteristics of this species are, a black bill; irides orange; nostrils reaching from the middle of the bill to the front; orbits violet; caruncle on the chin compressed, red, covered with a few hairs; crest oblong; body black-

black-green; back brown; neck, breast, and belly, spotted with white; legs red.

CUMANENSIS; JACU or YACOU. Blackish; crell and first quill-feathers white. It is about the size of a hen turkey. It is found in Cayenne and Guiana. It erects its crest, expands its tail, and cries in a mournful tone, like a young turkey. It builds on the ground, is easily tamed, and is often domesticated.

PIPILE; Piping Curassow. Caruncle on the chin blue; belly black; back brown, spotted with black. Like the last it is found in Cayenne and other parts of South America. The voice is weak and piping.

MARAIL; Marail Turkey. Greenish-black; naked orbits and legs red; throat nakedish, speckled with white. It is the size of a common fowl, and not dissimilar in shape. Though not much known to naturalists, it is common in the woods of Guiana, at a distance from the sea. It is generally seen in small flocks, excepting at breeding time, when it is only met with in pairs, and then frequently on the ground, or on low shrubs, at other times on high trees, on which it roosts during the night. The female builds her nest on some low bushy tree, as near the trunk as possible, and lays three or four eggs. When the young have been hatched for ten or twelve days, they descend with the mother, which scratches on the ground like a hen, and broods them, till they can shift for themselves. They breed twice a year. The young birds are easily tamed, and seldom forsake the places in which they have been brought up. Their cry is not unharmonious, unless they are irritated, when it is harsh and loud. Their flesh is good for food, and highly esteemed.

PENELOPE, a species of *Anas*. See **DUCK**.

PENEO, in *Geography*, a river of Thessaly, which runs into the Ægean sea; 20 miles E. of Larissa.

PENETRABILITY. See **IMPENETRABILITY**.

PENETRALE, among the Romans, properly denoted the chapel consecrated to the *penates*, or household gods.

PENETRATION, **PENETRATIO**, the act whereby one thing enters another, or takes up the place already possessed by another.

The schoolmen define penetration the co-existence of two or more bodies, so that one is present, or has its extension in the same place as the other.

Philosophers hold the penetration of bodies absurd, *i. e.* that two bodies should be at the same time in the same place; and accordingly, impenetrability is laid down as one of the essential properties of matter. See **MATTER**.

What we popularly call penetration only amounts to the matter of one body's being admitted into the vacuity of another. Such is the penetration of water through the substance of gold.

The theory of the penetration of bodies is of great importance in military and naval affairs, the object in all cases of battery being to communicate the greatest possible momentum to the obstacle intended to be destroyed, whether it be the gates of a fortress, or the sides of a vessel; or rather we would say, that the effect to be produced should be the greatest possible, and which, it is well known, depends in a great measure upon the proper charges employed. If the charge be too small, the velocity being also proportionally small, the momentum thus communicated may fail to produce the desired effect; and again, if the charge and velocity be too great, that is, if it be such that the impinging ball passes quite through the opposing obstacle, the momentum communicated to it in this case will also be less than if the ball had lodged within it. This may be illustrated by setting up a thin deal board upon its edge, and firing a ball through it from a musket or pistol, which if the charge be at all con-

siderable, may be done without throwing down the board, whereas the same ball cast from the hand against it would infallibly produce that effect. The reason for which is, that notwithstanding the great momentum of the ball in the former case, the time of its passage is so short, that the product of the momentum into the time (which is the measure of the effect) is so small, as not to be sufficient to overcome the natural gravity of the plank. The same thing is observed in naval actions, many balls passing completely through the sides of the vessel, the shocks of which are by far less than those which lodge within them, or than those which barely pass through, and similar effects are observed in the practice of land artillery, particularly when the opposing obstacle is wood, as in the gates, &c. of fortified places. See Moore's "Treatise on Military Rockets, &c."

These circumstances have induced most authors on gunnery, to consider the penetration of bodies as part of their subject, and various experiments have been instituted in order to furnish dates for this purpose. Of these authors, Robins and Dr. Hutton have made the greatest number of experiments, and particularly the latter, an ample account of which is given in vol. iii. of his *Treatise*, from which we have selected the following small tablet, exhibiting the velocity and diameter of the ball, the penetration, &c., each case, as stated below, being a mean of a great many experiments made with the same ball, or with equal balls, and with equal charges.

Velocity.	Substance.	Diam. of Iron Ball.	Penetration in Inches.
1600	Elm	1.96	20
1200	Elm	1.96	15
1500	Elm	2.78	30
1060	Elm	2.78	16
1200	Oak	5.04	34
1300	Earth	5.50	180

In all these experiments the gun was placed within such a distance of the obstacle as not to affect the initial velocity of the ball, and the penetration was made in the direction of the fibres, the wood perfectly sound, and cut off near the root of the tree. Now in order to make this table applicable to other cases, *viz.* when the diameter and density of the ball, and the projectile velocity are different from those above stated, we may proceed as follows.

Let d represent the diameter of the ball.

f , the height of a column of water equal to the resisting force of the obstacle, considering it as uniform.

n , the specific gravity of the ball, that of water being 1.

v , the velocity of projection.

$a = .7854$, the area of a circle to diameter 1.

Then $a d^2$ will be the area of the section, $a d^2 f$ the resistance, and $\frac{2}{3} a n d^3$ the weight of the ball; so that the resistance will be to the weight of the ball as $a d^2 f$ to $\frac{2}{3} a n d^3$,

or as f to $\frac{2}{3} n d$; that is, as $\frac{3f}{2nd}$ to 1, or gravity. Now the

velocity generated or destroyed by gravity in describing any space s , is $8\sqrt{s}$, thus found, as $\sqrt{16} : \sqrt{32} :: \sqrt{s} : 8\sqrt{s}$; and when the space is the same, the velocities generated or destroyed, are as the square roots of the forces, or the forces are as the squares of the velocities, and the velocity destroyed by the force

$\frac{3f}{2nd}$, in describing the space s , being

PENETRATION.

s , being v ; therefore $t : \frac{3f}{2nd} :: 64s : v^2$; hence $\frac{3f}{2nd} = \frac{v^2}{64s}$; consequently $f = \frac{nd}{3} \times \frac{v^2}{32s}$; and $s = \frac{ndv^2}{96f}$.

Hence it appears, that the depth penetrated is as the density and diameter of the ball, and the square of the velocity, divided by the strength or resisting force of the obstacle. So that if equal balls be discharged against the same obstacle, then shall the depths of penetrations be as the squares of the velocities, which pretty nearly agree with the experiments above stated. Hence also it follows, that if unequal balls, but of the same density, be discharged with equal velocity, the depths of penetration will be as the diameters of the balls; so that a greater ball will not only make a wider aperture, but will penetrate farther into the obstacle than a smaller ball, all other circumstances being the same in both. Again, if it be known from experiment, how far a given ball will penetrate into any substance with a given velocity, the force of resistance may be determined from the above formula $f = \frac{nd}{3} \times \frac{v^2}{32s}$, and hence the depth of penetration with any other ball, and with any other velocity, may be determined while the obstacle remains the same.

This however is upon a supposition, that the resistance of the obstacle is constant, like the force of gravity, which cannot in fact be the case, as it is obvious, that the farther a ball penetrates into any obstacle, the greater will be the resistance, in consequence of the increased density arising from the parts of the obstacle driven before the ball; but it is extremely difficult to establish any law of resistance that will answer in all cases, we must therefore adopt the hypothesis of uniform resistance, till farther experiments enable us to proceed with greater certainty; the resisting force of elm on

this supposition, according to the first four results in the above tables, will be as follows.

$$\begin{aligned} 1. f &= \frac{ndv^2}{32s} = \frac{7\frac{1}{2} \times 1.96 \times 1600^2}{32 \times \frac{2}{12}} = 20000. \\ 2. f &= \frac{ndv^2}{32s} = \frac{7\frac{1}{2} \times 1.96 \times 1200^2}{32 \times \frac{1}{12}} = 15000. \\ 3. f &= \frac{ndv^2}{32s} = \frac{7\frac{1}{2} \times 2.78 \times 1500^2}{32 \times \frac{3}{12}} = 16406. \\ 4. f &= \frac{ndv^2}{32s} = \frac{7\frac{1}{2} \times 2.78 \times 1000^2}{32 \times \frac{1}{12}} = 15362. \end{aligned}$$

The mean of these four results is 16692, which expresses the resisting force of elm, on the hypothesis of an uniform resistance, the force of gravity being assumed as unity; and now this value of f being established for elm, the formula

$$s = \frac{ndv^2}{96f}$$

will obviously furnish the means of determining s , or the depth of penetration in any other case that may be proposed. Also the resistance being supposed uniform, we

have, according to the doctrine of forces, $t = \frac{2s}{v}$ for the time of penetration.

In the second of the above recited experiments, the velocity of the ball is 1200 feet, and the depth of penetration 15 inches; let it hence be required to find the time of penetration, and the time of passing through each successive inch of the 15, and the velocity lost at each of them.

Here $v = 1200$ feet $= 14400$ inches, also $s = 15$ inches,

$$\text{whence } t = \frac{2 \times 15}{14400} = \frac{1}{480} \text{ of a second the time of penetration.}$$

Again, the velocities and times being as the square roots of the spaces, we have

Velocity lost.	$\sqrt{15} : \sqrt{15} - \sqrt{14} :: v$	Time in passing.
$\frac{\sqrt{15} - \sqrt{14}}{\sqrt{15}} v = 40.7$	$:: t :$	$\frac{\sqrt{15} - \sqrt{14}}{\sqrt{15}} t = .00007$ 1st inch.
$\frac{\sqrt{14} - \sqrt{13}}{\sqrt{15}} v = 42.2$	$:: t :$	$\frac{\sqrt{14} - \sqrt{13}}{\sqrt{15}} t = .00007$ 2d
$\frac{\sqrt{13} - \sqrt{12}}{\sqrt{15}} v = 43.8$	$:: t :$	$\frac{\sqrt{13} - \sqrt{12}}{\sqrt{15}} t = .00008$ 3d
$\frac{\sqrt{12} - \sqrt{11}}{\sqrt{15}} v = 45.7$	$:: t :$	$\frac{\sqrt{12} - \sqrt{11}}{\sqrt{15}} t = .00008$ 4th
$\frac{\sqrt{11} - \sqrt{10}}{\sqrt{15}} v = 47.8$ &c.	$:: t :$	$\frac{\sqrt{11} - \sqrt{10}}{\sqrt{15}} t = .00008$ 5th
$\frac{\sqrt{10} - \sqrt{9}}{\sqrt{15}} v = 50.3$	$:: t :$	$\frac{\sqrt{10} - \sqrt{9}}{\sqrt{15}} t = .00009$ 6th
$\frac{\sqrt{9} - \sqrt{8}}{\sqrt{15}} v = 53.2$	$:: t :$	$\frac{\sqrt{9} - \sqrt{8}}{\sqrt{15}} t = .00009$ 7th
$\frac{\sqrt{8} - \sqrt{7}}{\sqrt{15}} v = 56.6$	$:: t :$	$\frac{\sqrt{8} - \sqrt{7}}{\sqrt{15}} t = .00010$ 8th
$\frac{\sqrt{7} - \sqrt{6}}{\sqrt{15}} v = 60.8$	$:: t :$	$\frac{\sqrt{7} - \sqrt{6}}{\sqrt{15}} t = .00011$ 9th
$\frac{\sqrt{6} - \sqrt{5}}{\sqrt{15}} v = 66.1$	$:: t :$	$\frac{\sqrt{6} - \sqrt{5}}{\sqrt{15}} t = .00012$ 10th
$\frac{\sqrt{5} - \sqrt{4}}{\sqrt{15}} v = 73.2$	$:: t :$	$\frac{\sqrt{5} - \sqrt{4}}{\sqrt{15}} t = .00013$ 11th

P E N

$$\frac{\sqrt{4} - \sqrt{3}}{\sqrt{15}} \quad v = 83.0$$

$$\frac{\sqrt{3} - \sqrt{2}}{\sqrt{15}} \quad v = 98.5$$

$$\frac{\sqrt{2} - \sqrt{1}}{\sqrt{15}} \quad v = 128.3$$

$$\frac{\sqrt{1} - \sqrt{0}}{\sqrt{15}} \quad v = 309.8$$

Sum 1200

P E N

$$\frac{\sqrt{4} - \sqrt{3}}{\sqrt{15}} \quad t = .00014 \text{ 12th inch.}$$

$$\frac{\sqrt{3} - \sqrt{2}}{\sqrt{15}} \quad t = .00017 \text{ 13th}$$

$$\frac{\sqrt{2} - \sqrt{1}}{\sqrt{15}} \quad t = .00022 \text{ 14th}$$

$$\frac{\sqrt{1} - \sqrt{0}}{\sqrt{15}} \quad t = .00054 \text{ 15th}$$

Sum $\frac{1}{480} = 00208$

Hence, as the motion lost at the beginning is very small, and consequently the motion communicated to any body, as an inch plank, in passing through it, very small also; we may conceive how such a plank may be shot through when standing upright without overfetting it. For more on this subject, see Hutton's Traacts, vol. iii. p. 288.

PENEUS, in *Ancient Geography*, and *Mythology*, a river of Theffaly, which ran from W. to E., its source being in mount Pindus, and its mouth at the entrance of the Thermaic gulf. Some doubts have been suggested concerning the course of this river. The ancients thought that the breach by which it discharged itself into the sea, was occasioned by an earthquake, that separated the mountains. Hence it has been sometimes called "Araxes," from *αραξω*, feindo, to cleave. The modern name of "Salampria" is ancient, as, according to Eustathius, this river was in his time called "Salimprias," a name, according to Hesychius, of Greek origin, *σαλαβρη* and *σαλαμβρη*, signifying the openings of gates.

Most authors are of opinion, that Deucalion's deluge was occasioned by the river Peneus. (See DEUCALION.) To this purpose, Herodotus observes, (l. i.) "It is said that Theffaly once was nothing but a lake, being environed on all sides with hills. The country which lies between those hills is what they call Theffaly, which is watered with plenty of rivers, the chief of which are the Peneus, the Apidannus, the Onfchones, the Eripeus, and the Panito. These five rivers, falling down from the neighbouring mountains, after having run through the low country, difembogue themselves into the sea by a very narrow canal, where they all unite, and make but one great river, which retains the name of Peneus. They tell us farther, that before the canal was made, these rivers flooded the whole country, and turned it into a great lake; but that Neptune having formed that great canal, all the waters retired." Peneus, on account of its beauty, was an object of worship.

PENEUS, a river of the Elide, in the northern part of the country, which flowed from its source eastward towards mount Scollis by Elis, and discharged itself into the sea to the west of Ephyra.—Also, a name given to the Araxes, a river of Armenia, on account of its resemblance to the Peneus of Theffaly, according to Strabo.

PENGEBUR, a town of Persia, in the province of Mecran; 130 miles N. of Kidge.

PENGHIOUM, a town of the Birman empire, at the confluence of a small river with the Irrawaddy; near Yay-nangheoum, or Earth-oil creek.

PENGUIN, in *Ornithology*, a name given by sailors of different nations to two different species of water-fowl, both web-footed, and both wanting the hinder toe.

The penguin of the English is the bird more commonly

known by the name of the *goirfugel*, or the *alca impennis* of Linnæus. See ALCA.

The penguin of the Dutch is the *anser Magellanicus* of Clusius. See PINGUIN.

PENGUIN, or *Wild Ananas*, *Karatas*, in *Botany*. See BROMELIA.

PENGUIN *Island*, in *Geography*, a small island near the coast of New Holland, at the entrance into Adventure bay. N. lat. 43° 21'. E. long. 147° 33'.—Also, a small island near the Cape of Good Hope, a little to the north of Table bay.—Also, an island near the S. coast of Newfoundland. N. lat. 47° 22'. W. long. 56° 45'.—Also, a small island near the coast of Patagonia; nine miles S.E. of Port Desire.

PENIA, in *Mythology*, the goddess of Poverty, and mother of Love.

PENICHE, in *Geography*, a sea-port town of Portugal, in Estramadura, situated on a peninsula, which runs into the Atlantic; fortified and defended by a citadel; containing three parishes, and about 2800 inhabitants. This town is sometimes called "New Lisbon;" 39 miles N.N.W. of Lisbon. N. lat. 39° 20'. W. long. 9° 5'.

PENICILLA, thus called from *penicillus*, a *penicil*, which it is supposed to resemble in shape, in *Pharmacy*, a lozenge; or form of medicine made round by rolling.

PENICILLI MARINI, in *Natural History*, a sort of marine tubuli, or cases of sea-worms, making a distinct genus of those shells. They are defined to be shelly tubes, very slender, and terminating in the shape of a painter's penicil; many of them in their native shape adhering to stones, &c. on the sea-shores, by means of a soft and lax substance. Some of these are white and pellucid, others yellowish or brown; and the more common sort are about a finger's length, and about the thickness of a wheaten straw; and some are of a sort of funnel-like shape, and have their mouths surrounded by a sort of hairs, or filaments. These are called by some *proboscipleetani*, others are called *cadi*, and others *entafia*.

PENICILLUS, among *Surgeons*, is used for a tent, to be put in wounds, or ulcers.

PENIDIUM, in *Pharmacy*, barley-sugar.

Dr. Quincy uses the word penidium for a kind of clarified sugar, with a mixture of starch, made up into little lumps.

PENJEKORCH, in *Geography*, a river of Asia, which runs into the Sewad, about five miles S. of the town of the same name. This river joins another S.E. of the town of Bijore, and in its course separates the province of that name on the W., from Sewad, on the E.

PENJEKORCH, a river of Candahar, in Cabulistan; eight miles W. of Mashanger.

PENIGK, or PENIG, a town of Saxony, and capital of

of a lordship, in the principality of Schonburg, on the Muldau. In this place are a manufactory of woollen stuffs, and a pottery; 38 miles W. of Dresden. N. lat. $50^{\circ} 52'$. E. long. $12^{\circ} 35'$.

PENING, a town of Bavaria, in the principality of Aichilatt; nine miles E.N.E. of Aichtatt.

PENINSULA, in *Geography*, a portion or extent of land, joining to the continent by a narrow neck or isthmus; the rest being encompassed with water.

The word is compounded of the Latin *pene* and *insula*, q. d. *almost island*, which the French pertinently enough render *presque îlle*.

Such is Peloponnesus, or the Morea; such also are Africa, Jutland, &c.

Peninsula is the same with what is otherwise called cheronessus.

PENINSULA Point, a cape on the W. coast of the island of Mindoro. N. lat. $12^{\circ} 40'$. E. long. $120^{\circ} 56'$.

PENINUS, or PENIN, in *Mythology*, a god acknowledged by the Penini, inhabitants of the Alps, from whom that chain of mountains derived its name: as we learn from Livy, Dec. 3. l. xi. n. 38. Guichenon, in his History of Savoy, has preserved the inscription that was upon the pedestal of a fine statue, that represented this god under the figure of a young man naked, in these terms, "L. Lucilius Deo Penino optimo Maximo donum dedit." Cato and Servius (in 3 Æn.) say, that this was a god, but a goddess, whom the one calls Penina, and the other Apenina; but both the figure and the inscription express the contrary. The statue of that god was afterwards carried off, and that of Jupiter put in its place. Nevertheless, the worship of Peninus was not abolished, but the mountaineers continued to pay adoration to him. Some say this god was Jupiter himself, which they infer from the epithets "Optimus Maximus;" but others say that he was the Sun; and that the carbuncle upon the statue, called Peninus's eye, was the same with that of Osiris, who, in Egypt, represented the sun.

PENIS, in *Anatomy*;

PENIS, *Arteria dorsalis et profunda*;

PENIS *erector*, a muscle of the organ;

PENIS *glans et preputium*;

PENIS *glandula odoriferæ*;

PENIS, *Vena magna*;

PENIS, *Amputation of*, in *Surgery*.

This operation is sometimes rendered indispensable by carcinomatous diseases, in which the mischief has not as yet extended itself either too far towards the pubes, or to the glands in the groin. It is also very erroneously recommended to be practised in cases of mortification; but every judicious surgeon will be of opinion, with Sabatier, that here it is entirely unnecessary, because if the disorder has ceased to spread, the dead part will be thrown off by a spontaneous process; and if the gangrene is still spreading, the operation is not likely to check its progress. The manner of operating is as follows: Sabatier advises the surgeon to take hold of the part with his left hand, and draw the integuments forwards, while with one sweep of the knife he makes the requisite division. A catheter is then to be introduced into the bladder. Were this precaution neglected, the corpora cavernosa and urethra might become retracted towards the pubes, and the orifice of the urethra be covered with the redundant skin, so as to obstruct the passage of the urine. Le Dran saw such an accident happen, and was obliged to puncture the skin, in order to enable the patient to make water.

This operation is occasionally followed by a considerable

degree of hemorrhage. The blood sometimes gushes out of the middle pudendal vein, and the arteries which ramify at the lateral and upper parts of the corpora cavernosa, while there is also a general flow of it from the spongy substance of the corpora cavernosa and urethra. This sort of bleeding is, in general, to be stopped like other hemorrhages. If the vessels appear large, they should be immediately tied. When they seem to be of more moderate size, and the blood only oozes from the corpora cavernosa, styptics and compression will answer.

After suppuration has taken place, Sabatier conceives that the catheter is no longer needed. Towards the completion of the healing, care must be taken to keep the orifice of the urethra from becoming contracted, should any tendency of this kind shew itself.

PENIS of Birds. See *Anatomy of Birds*

PENISAARI, in *Geography*, an island of the Baltic, three versts long, and distant six versts from Lavanfaari, which see. It is inhabited only by a few families, and has no water-springs.

PENISCOLA, a town of Spain, in Valencia, situated on the coast of the Mediterranean, surrounded on three sides by the sea, and difficult of access by land; 24 miles S. of Tortosa. N. lat. $40^{\circ} 24'$. E. long. $0^{\circ} 24'$.

PENISHEHR, or PENJESHEHR, a town of Candahar, and capital of a district in the Cabulistan, on the E. side of the Hindoo Koo mountains; 46 miles N. of Cabul. N. lat. $35^{\circ} 16'$. E. long. $68^{\circ} 24'$.

PENISTONE, or PENNISTON, a small market-town in the wapentake of Staincross, and liberty of the honor of Pontefract, West Riding of Yorkshire, England, is situated eight miles W.S.W. from Barnsley. The market is on Thursday, but it is little frequented. Here are four annual fairs, which are chiefly noted for the sale of moor sheep. The town is environed with dreary moors, especially to the westward, where nothing presents itself to the eye but bleak and barren mountains, covered with heath or ling. Penistone, according to the population returns of 1811, contains 115 houses, and 515 inhabitants. The church here is a large structure, and near the centre of the town is a well endowed grammar school. Beauties of England and Wales, vol. xvi. by John Bigland.

PENITENCE, PENITENTIA, is sometimes used for a state of repentance, and sometimes for the act of repenting. See REPENTANCE and IMPENITENCE.

PENITENCE is also used for a discipline, or punishment attending repentance; more usually called *penance*.

PENITENCE also gives the title to several religious orders, consisting either of converted debauchees, and reformed prostitutes; or of persons who devote themselves to the office of reclaiming them. Of this latter kind is

PENITENCE, *Order of, of St. Magdalen*, established about the year 1272, by one Bernard, a citizen of Marseilles, who devoted himself to the work of converting the courtezans of that city.

Bernard was seconded by several others; who, forming a kind of society, were at length erected into a religious order by pope Nicholas III. under the rule of St. Augustine.

F. Gesnay adds, that they also made a religious order of the penitents, or women they converted, giving them the same rules and observances which they themselves kept.

PENITENCE, *Congregation of, of St. Magdalen, at Paris*, owed its rise to the preaching of F. Tisseran, a Franciscan, who converted a great number of courtezans about the year 1492. Louis, duke of Orleans, gave them his house for a monastery; or rather, as appears by their constitutions, Charles

Charles VIII. gave them the hotel, called Bochaigue, whence they were removed to St. George's chapel, in 1572. By virtue of a brief of pope Alexander, Simon, bishop of Paris, in 1497, drew them up a body of statutes, and gave them the rule of St. Augustine.

To qualify a woman for admission, it was required, that she had committed the sin of the flesh. None were admitted who were above thirty-five years of age.

Till the beginning of the last century, none but penitents were admitted; but since its reformation by Mary Alvequin, in 1616, none have been admitted but maids, who, however, still retain the ancient name penitents.

PENITENTIAL, **PENITENTIALE**, an ecclesiastical book, retained among the Romanists; wherein is prescribed what relates to the imposition of penance, and the reconciliation of penitents.

In the Capitulars of Charlemagne, the priests are enjoined to study well their Penitential. There are various Penitentials: the Roman Penitential, that of Venerable Bede, that of pope Gregory III. &c.

PENITENTIARY, **PENITENTIARIUS**, an office, or tribunal, in the court of Rome, wherein are examined, and delivered out, the secret bulls, graces, or dispensations, relating to conscience, confession, &c.

The expeditions of the penitentiary are sealed up with red wax, and sent close; directed to the confessors.

PENITENTIARY is also an officer or dignitary, in some cathedrals, vested with power from the bishop to absolve in cases reserved to him; on which account he is also called the *bishop's ear*.

In some places there is a grand penitentiary, and a sub-penitentiary. Anastasius says, that pope Simplicius chose some among the Roman priests to preside over penances. At present the pope has his grand penitentiary, who is a cardinal, and the chief of the other penitentiary priests established in the patriarchal churches of Rome, who consult him in all difficult cases.

He presides in the penitentiary, dispatches dispensations, absolutions, &c. and has under him a regent, and twenty-four proctors, or advocates of the sacred penitentiary.

PENITENTIARY Houses, for the punishment of convicts. See **TRANSPORTATION**.

PENITENTS, in the church of Rome. See **PENITENTES**.

PENITENTS, an appellation given to certain fraternities, or societies of persons who assemble together for prayers, make processions bare-footed, their faces covered with linen, and give themselves discipline, &c.

There are White Penitents in Italy, at Avignon, and at Lyons. There are also Blue Penitents, and Black Penitents, which last assist criminals at their death, and give them burial.

PENITENTS, or *Converts of the name of Jesus*, a congregation of religious at Seville, consisting of women, who had led a licentious life, founded in 1550.

This monastery is divided into three quarters: one for professed religious; another for novices; a third for those under correction.

When these last give signs of a real repentance, they are removed into the quarter of the novices, where, if they do not behave themselves well, they are remanded to their correction. They observe the rule of St. Augustine.

PENITENTS of Orvieto, are an order of nuns, instituted by Antony Simoncelli, a gentleman of Orvieto. The monastery he built was at first destined for the reception of poor girls, abandoned by their parents, and in danger of losing their virtue.

In 1662 it was erected into a monastery, for the reception of such as, having abandoned themselves to impurity, were willing to take up, and consecrate themselves to God by solemn vows. Their rule is that of the Carmelites.

These religious have this in peculiar, that they undergo no noviciate. All required is, that they continue a few months in the monastery in a secular habit; after which they are admitted to the vows.

PENKEMAS POINT, in *Geography*, a cape or headland of South Wales, on the N. point of the county of Pembroke, at the mouth of the Tivy, four miles below Cardigan.

PENKRIDGE, a market-town in the hundred of Cuddleston, and shire of Stafford, England, is seated on the river Penk, whence its name is supposed to have been derived, at the distance of six miles to the south of Stafford. It is of very great antiquity, and, according to Camden, was the site of the Roman station, Pennocrucium, mentioned in the Itinerary of Antoninus; but Plot, Stukeley, and Horsley, place that station at the neighbouring village of Stretton; and Salmon transfers it to Oldbury, in Warwickshire. And though thus entertaining different opinions respecting the actual position of Pennocrucium, all these authors agree in considering the present town of Penkridge as the immediate offspring of the deserted station. Some Roman remains were discovered here about the middle of the last century, and among other smaller articles, a brass head of the bolt of a catapulta.

Penkridge is but a small mean looking town, containing, according to the late population returns, 204 houses, and 925 inhabitants, who are principally engaged in different departments of the iron trade. The market day is Tuesday; and there are, besides, two fairs annually, which are resorted to for saddle and draught horses. Here is an excellent charity school for the clothing and education of twelve boys and eight girls. The church is an old edifice, with a square tower at the west end. In the reign of king Stephen it was collegiate, and belonged to the united fees of Lichfield and Coventry; but it was afterwards bestowed on John, archbishop of Dublin, and his successors, who were perpetual deans of the college, and had the collation of all the prebendaries, who were thirteen in number. The revenue of this college was estimated at 106*l.* 15*s.* at the time of the dissolution. The lands in Penkridge and its vicinity descend according to the rule of "Borough English."

Lapley, a small village to the south of this town, is distinguished as the site of an alien priory for black monks, which was annexed as a cell to the abbey of St. Remigius at Rheims, on whom it was bestowed by Aylmer, earl of Chester and Mercia, in the time of Edward the Confessor. At its suppression by Henry V. its site and possessions were given to the college of Tong. The church belonging to this priory is still standing, and is now the parochial place of worship. It has a handsome tower, which rises between the chancel and the body of the church.

Near this village is Stretton, above-mentioned, as the supposed site of Pennocrucium. An elegant seat here, belonging to the family of Monckton, was anciently the property of the Congreves, ancestors to the celebrated dramatic poet of that name. The Roman road, called the Watling street, passes close to the south side of the village. Tanner's *Notitia Monastica*; Camden's *Britannia*; and *Beauties of England and Wales*, vol. xiii. by Mr. Nightingale.

PENKUM, a town of Anterior Pomerania, which has suffered greatly by war and fire; 15 miles S.W. of New Stettin. N. lat. 53° 19'. E. long. 14° 20'.

PENLAU LENGAU, a river of Austria, which flows from

from lake Alben, and runs into the Traun; four miles S.W. of Wells.

PENLEE POINT, a cape in the English channel, on the S. coast of the county of Cornwall.

PENLLYN, WILLIAM, in *Biography*, one of the successful champions on the harp, at the Eisteddfod, or session of the bards and minstrels, appointed in the ninth year of queen Elizabeth, at Caerwys in North Wales, where he was elected one of the chief bards and teachers of Instrumental Song. Pennant's Tour in North Wales, 1773, printed 1778.

PENMAEN MAUR, in *Geography*, a large and lofty mountain of Caernarvonshire, North Wales, rises with a rapid ascent from the southern shore of the Menai river. Its summit is about 1540 feet above the level of the sea. On the top is an ancient British fortress called "Braich y Dinas," also a bardic, or druidical circle of upright and prostrate stones. Near the base of the mountain, on the north side, is a turnpike road, from Aber-Conway to Bangor, &c., which has been formed with much difficulty and expence. In some parts it is constructed on arches, thrown across fissures, and in other parts it hangs over a steep and lofty precipice, about 200 feet above the sea, and presents a terrific appearance to the traveller. A wall has been built to guard against dangers. "The summit," says Mr. A. Aikin, "is a rude mass of shattered rock, covered with heath, difficult of ascent, and the descent even far greater than at any time we had before experienced." See Pennant's Tour in North Wales.

PENMAN HEAD, a cape of Scotland, on the N. coast of Aberdeenshire. N. lat. $57^{\circ} 37'$. W. long. $2^{\circ} 9'$.

PENMARCK POINT, a cape on the W. coast of France, S. of a bay which takes its name from the town of Audierne; 15 miles S.S.E. of Audierne. N. lat. $47^{\circ} 48'$. W. long. $4^{\circ} 17'$. East of this point are Penmarek rocks.

PENN, Sir WILLIAM, Knt., in *Biography*, an admiral of England, and one of the commanders at the taking of Jamaica, was born at Bristol, 1621. Being addicted from his youth to the sea, he became a captain at twenty-one, and after several intermediate promotions was made admiral in the first Dutch war, at thirty-two years of age. In 1655 he came home, and was chosen member of parliament for Weymouth, not without hereby incurring the displeasure of the republican government, by which he was committed for a while to the Tower, on a charge of quitting his command without leave to the hazard of the army. Upon the restoration of the monarchy, he was made a commissioner of the admiralty and navy, governor of the town and fort of Kinsale, vice-admiral of Munster, and one of the council of that province. After sustaining the chief command, under the duke of York, in the victory over the Dutch in 1665, he took leave of the sea, but continued in his other employments till 1669, when, growing infirm, he retired to Wanstead, in Essex, and died there the year following. He is said to have acquitted himself, in his several high offices, with honour and fidelity.

PENN, WILLIAM, an illustrious person among the Quakers, and founder of the colony of Pennsylvania, was the son of the admiral above-mentioned, by his wife Margaret, daughter of John Jasper, merchant of Rotterdam. He was born in London, in the vicinity of the Tower, 14th October, 1644. His father gave him a liberal education, induced, no doubt, to greater care in the finishing of it, by prospects of his son's advancement at court, where he himself was in high favour. But the mind of the son was formed for other pursuits, and before he had passed his

twelfth year, was already glowing with a sensibility to religion, which eventually unfitted him for the employments of a corrupt court, and gave him to others of a more honourable and beneficent nature. He was placed first at Chigwell school, in Essex, then at a private academy on Tower Hill, with the advantage besides of a tutor; and lastly, in 1660, entered a gentleman commoner of Christ-church college. He continued at Oxford two years, and was intimate with Robert Spencer, afterwards earl of Sunderland, and with John Locke. Though fond at this time of youthful sports, he had strong religious impressions; and, together with some other students, withdrew from the national way of worship to hold private meetings, at which they preached and prayed among themselves. This conduct gave great offence to the heads of his college; the parties were fined for nonconformity, and, proceeding after this to some public acts of imprudent zeal, Penn and several others were expelled the college. Returning home, he continued to affect the company of religious persons; from which his father, seeing the obstacles it would throw in his way to preferment, endeavoured both by words and blows to deter him; and finding all methods ineffectual, became at length so incensed, that he turned him out of doors. The patience of young Penn held out under this rough treatment, until (parental affection taking place of anger, and possibly suggesting the expedient) his father concluded to send him, in company with some persons of rank, on a tour to France. This took place in 1662. Here, though he spent some time in study under the celebrated Protestant preacher, Moses Amyraut, the very different conversation of other associates at length diverted his thoughts from religion. He had however acquired the language, together with the polished manners of the French, when, in 1664, he was recalled by his father from Turin, to which place he had proceeded from Saumur, the residence of Amyraut. The admiral joyfully received his son, concluding the main point (of his fitness for promotion) was now gained. He was admitted of Lincoln's Inn to study the law, where he continued till the breaking out of the pestilence, soon after which, being now twenty-two years of age, his father put under his management a considerable estate in Ireland, and he went to reside in that kingdom.

In solitude, the religious struggle in Penn's breast revived. On the one hand, natural vivacity, personal accomplishments, and the respect and favour of his friends attracted his regard to the present world: on the other, devotion, and an indelible sense of duty, fixed his contemplations on the next. He had been affected, about ten years before this time, by the preaching of Thomas Loe, a Quaker: and, being at Cork, was informed of a meeting for worship, then about to be convened, as it seems, by desire of the same person. Penn attended it, and Loe delivered a discourse, beginning with the words, "There is a faith, that overcomes the world, and there is a faith, that is overcome by the world;" on which he is said to have expatiated with much clearness and energy. His doctrine agreeing with the previous experience and present disposition of Penn, he now inclined to enter into communion with the Quakers, and from this time constantly attended their meetings. At one of these, held at Cork, November 1667, he, with many others, was apprehended by order of the mayor, who would have liberated Penn upon his giving bond for his good behaviour; but the latter, deeming the meeting no misdemeanour, refused bond, and was sent to prison with the rest. He wrote a few lines to the earl of Orrery, containing exceptions to the mayor's proceedings, an argument against persecution, and a request "for the speedy releasement of all" who had been

been committed on the occasion. The earl contented himself with ordering Penn's discharge.

His father, being informed by a nobleman of his acquaintance of the danger his son was in of being profelyted to Quakerism, remanded him home, and was readily obeyed. Penn had now again to pass through the ordeal of parental displeasure, and in this a principal object seems to have been, his continuance in the exterior of his education, or, as his biographer has it, in the customs and fashions of the age. But so fixed was he in the resolution to follow what he esteemed a manifestation of the will of God in his conscience to the contrary, that, although he behaved on these occasions with Christian meekness and filial affection, neither threats nor entreaties could move his constancy. The honour of the hat (in these times a matter of no light esteem) was especially contended for by the punctilious admiral; who, at last, would have tolerated his son in other instances of nonconformity, on condition that he should be uncovered before the king, the duke of York, and himself. Penn took time to consider of this proposal in secret, he even made it a subject of fasting and supplication to God to be directed aright, and he deliberately refused the terms. This was sacrificing much to sincerity and consistency in his profession, for his father, upon this, finding his hopes of the *courtier* at an end, could no longer endure the *son* in his presence, and he was a second time driven from the paternal mansion. His integrity was now put to a severe proof: it appears, that he found a shelter among his adopted friends the Quakers, while his mother privately supplied his wants. At length the admiral relented, so far as to wink at his return to the family; and when in consequence of being found at religious meetings (by the state then called seditious conventicles) he was at any time imprisoned, would privately use his influence to get him released.

The talents of Penn were soon devoted to the support of the doctrine he had espoused. He became a preacher among the Quakers, and published in 1668, on their behalf, a piece entitled "Truth exalted:" another occasion, however, more important in its consequences, presently occurred. A preacher, named Thomas Vincent, irritated by the going over of two of his hearers to the Quakers, accused the latter of holding erroneous doctrine concerning the Trinity. A dispute was held in consequence, in a meeting-house belonging to a Presbyterian congregation in London, chiefly between Vincent on the one part, and George Whitehead, an eminent Quaker, on the other. Vincent began by stating (in the gentle phrase of the time) that the Quakers held "damnable doctrines;" which being denied, he followed up his charge with a question, whether they owned "one Godhead subsisting in three distinct and separate persons." Whitehead, and those with him, rejecting these terms as unscriptural, Vincent framed the following syllogism; "There are three that bear record in heaven, the Father, the Word, and the Holy Ghost, and these three are one. These are either three manifestations, three operations, three substances, or three somethings else besides subsistences: but they are not three manifestations, three operations, three substances, nor three any things else besides subsistences: *ergo*, three subsistences."—Whitehead again rejected the terms, as not to be found in scripture, nor deducible from the text; and observing "that God did not use to wrap up his truths in heathenish metaphysics, but to reveal them in plain language," he desired an explanation. This was safe ground, though likely to prove barren of scholastic argument; but Penn, either not aware of its advantage, or as yet too full of Aristotle, chose to deny the *minor* of the syllogism, and went into some distinctions, using the rejected terms sub-

stance and subsistence. After much of this sort of logic, and some abuse bestowed on the Quakers, the dispute ended, for the present, to the satisfaction of neither side. In prosecution of the controversy thus raised, Penn wrote a piece with the following title: "The sandy Foundation shaken, or those so generally believed and applauded Doctrines, of one God, subsisting in three distinct and separate Persons: the Impossibility of God's pardoning Sinners: a plenary Satisfaction: the Justification of impure Persons by an imputative Righteousness; refuted from the Authority of Scripture and right Reason." The dispute with Vincent had excited much attention. This publication did more; it stirred up the vindictive spirit of intolerance. It was evil spoken of, says Sewel, the historian of the Quakers, and not long after Penn was committed to the Tower; and, as some thought, not without his father's being acquainted with it, perhaps to prevent a worse treatment. From what quarter this was apprehended, we shall see presently; for Penn being thus secured in the Tower, and denied the access of his friends, his servant one day brought him word (as it seems, from the admiral) that the *bishop of London* was resolved he should either publicly recant, or die a prisoner. His reply evinced a mind unterrified at the prospect of sufferings, which he considered as inflicted for conscience sake: and he began to occupy his solitude with religious compositions, the most considerable among which was a practical treatise on the Christian religion, entitled "No Cross No Crown." In this work, his contemporary, Dr. Henry More, says, he has treated the subject of a future life, and the immortality of the soul, with a force and spirit equal to most writers. It has passed through many editions.

After near seven months duration, Penn wrote to the secretary of state, lord Arlington, requesting to be heard in his own defence before the king, and complaining warmly of the manner in which his sentiments had been misrepresented by his enemies. In this letter several just and noble sentiments occur. He tells his lordship, "that he is at a loss to imagine how a diversity of religions opinions can affect the safety of the state, seeing that kingdoms and commonwealths have lived under the balance of divers parties. He conceives that *they only are unfit* for political society, who maintain principles *subversive of industry, fidelity, justice, and obedience*; but to say that men must form their faith of things *proper to another world*, according to the *prescriptions of other mortal men in this*, and, if they do not, that they have no right to be at liberty, or to live in this, is both ridiculous and dangerous. He maintains that the understanding can never be convinced by other arguments than what are adequate to its own nature. Force may make hypocrites, but can make no converts, &c. &c." He now likewise published a short piece, entitled "Innocency with her open Face, presented by way of Apology for the Book, entitled The sandy Foundation shaken." He here says, "that which I am credibly informed to be the greatest reason of my imprisonment, and of that noise of blasphemy which hath pierced so many ears of late, is my denying the divinity of Christ, and divesting him of his eternal Godhead; which most busily has been suggested, as well to those in authority, as maliciously insinuated among the people." In confutation of which charges, he proceeds to prove from scripture the Godhead of Christ. Both of these tracts were republished in the collection of his works, in folio, 1771; and the reader, who desires to obtain a just view of his sentiments on the several controverted points, will do well to compare them with each other, and with his doctrinal works at large. Soon after this explanatory defence, Penn was liberated from the Tower, and went to Ireland, where he seems to have been

occupied for twelve months in the care of his father's estate, and in various services to his friends, the Quakers; after which he returned to England.

In the year 1670, the Quakers being persecuted by some magistrates, under the act against conventicles, were forcibly kept out of their meeting-house in Gracechurch-street. They met as near it as they could, in the street, agreeably to their practice in such cases; and their firmness herein eventually procured them the free exercise of their right. On the occasion alluded to, Penn, preaching in the street, was apprehended by warrant from sir Samuel Starling, lord mayor, and committed to Newgate. At the next sessions at the Old Bailey he was indicted, along with William Mead, another eminent Quaker, for meeting in, and conspiring to preach to an unlawful and tumultuous assembly. He made, says his biographer, a brave defence, discovering both the free spirit of an Englishman, and the undaunted magnanimity of a Christian, inasmuch that, notwithstanding the most partial frowns and menaces of the bench, the jury acquitted them both. It ought to be added, that this jury exhibited an instance of firm, persevering justice, under most tyrannical and indecorous treatment by the court, worthy of the notice and remembrance of every Englishman. They were fined for the verdict which they had brought in, and ordered to be imprisoned till the fines were paid. But this dangerous assumption of power was afterwards adjudged illegal by the court of common pleas, on which occasion the chief justice Vaughan distinguished himself by a very able speech in vindication of the rights of juries. The trial of Penn and Mead is inserted in the collection of Penn's works, and has been also published separately.

Not long after this event admiral Penn died, perfectly reconciled to his son, to whom he left an estate of 1500*l.* *per annum.* Penn engaged about this time in a public dispute, at Wycomb, with Jeremy Ives, a celebrated Baptist, on the universality of a divine light in the minds of men; which doctrine Ives undertook to disprove, but seems to have quitted the field to his antagonist immediately after stating his argument. In the month called February 1670-1, Penn was again committed, on the pretext of preaching publicly, to Newgate, where he remained six months. It is observable that he had recently published a piece in favour of liberty of conscience, and another entitled "A seasonable Caveat against Popery;" the one probably offensive to the intolerant clergy, the other to the court. At his commitment he held a spirited dialogue on persecution with sir John Robinson, lieutenant of the Tower; at the close of which, the latter calling for an officer with a file of musketers, "No, no," said Penn, "send thy lacquey, *I know the way to Newgate.*"

Early in 1672 he married Gulielma Maria, daughter of sir William Springett, formerly of Darling in Sussex. He settled at Rickmansworth, Herts, continuing to render service, both by preaching and writing, to the religious cause in which he was now engaged for life. Nor did he neglect an attention to the interests of his country, but published, in this year, a pamphlet entitled "The proposed Comprehension soberly and not unseasonably considered;" and in 1675, a larger work, the title of which is "England's present Interest considered, with Honour to the Prince, and Safety to the People, in Answer to this one Question, What is most fit, easy, and safe, at this Juncture of Affairs, to be done, for quieting of Differences, allaying the Heat of contrary Interests, and making them subservient to the Interest of the Government, and consistent with the Prosperity of the Kingdom?" The answer to this, and the argument of the piece, is in three things: "1. An inviolable and impartial

maintenance of English rights. 2. Our superiors governing themselves upon a balance (as near as may be) towards the several religious interests. 3. A sincere promotion of general and practical religion." Becoming, about this time, interested in the property of West Jersey, he took an active part in the measures used to promote the settlement of that province.

In 1677 Penn, in company with George Fox, Robert Barclay, and others, went over to Holland, and assisted at a general meeting of the *Friends* in those parts, held for the purpose of settling their religious discipline; and those at Dantzic being under persecution, Penn wrote, in their name, an address to the king of Poland, with a confession of faith, and a request that he would interpose for them. He then proceeded with Barclay to Herwerden, the court of the princess Elizabeth of the Rhine, elder sister of Sophia, electress of Hanover, on whom the succession of the crown of England was afterwards settled. Their object was a religious visit to this princess, and the countess of Hornes, her companion, both Protestants, and the former esteemed one of the most learned of her sex in that age. Some correspondence, begun upon the report of their extraordinary piety, had opened the way for a personal interview. Penn and his companion were well received at Herwerden: a correspondence by letter was afterwards kept up between the former and the princess, and she dying in 1680, he inserted in the second edition of his "No Cross no Crown" a testimony to her highly exemplary character. In returning through Germany and Holland, he preached in many places, at meetings convened for the occasion. He was heard, this year, before a committee of parliament, in support of a petition from the Quakers, who were oppressed by prosecutions in the exchequer, under statutes enacted against the Papists, but converted by some magistrates into engines of annoyance to Protestant dissenters. In 1679, and during two years following, he published several things; as, "An Address to Protestants;" "England's great Interest in the Choice of this new Parliament," a piece dedicated to the electors; and "One Project for the Good of England," which he presented to the parliament itself. He likewise exerted himself to procure the return of Algernon Sidney as a member of the house, first at Guildford, and afterwards at Bramber. About this time he was elected a fellow of the Royal Society.

We come now to the most considerable of Penn's actions, the settlement of a colony in North America, on liberal and pacific principles. A tract of country on the west side of the Delaware, (formerly belonging to the Dutch, and called the New Netherlands,) was granted on petition, by Charles II., to William Penn, and his heirs, in consideration of admiral Penn's services, and of debts due to him from the crown at his decease. To this the duke of York added, by cession, a further contiguous portion of territory, seated lower on the Delaware. The king's patent bore date the 4th of March, 1680-1; and in this instrument he gave to the province, in honour of the patentee, its new name of Pennsylvania. Penn, being thus constituted absolute proprietor and governor, published "A brief Account of the Province of Pennsylvania," in which he proposed terms of settlement to such as might incline to remove thither, offering land at forty shillings purchase, and one shilling *per annum* quit-rent, for one hundred acres. A great number of buyers came forward, several of whom formed a company, calling themselves "The free Society of Traders in Pennsylvania." Three ships presently departed, with adventurers from England and Wales, chiefly industrious and reputable persons of Penn's own communion. Two of these arrived on the coast

in time to winter; the third was detained till spring in the West India islands. Thus was the settlement begun, the proprietor being occupied meantime in providing a government for the colony, and in concerting measures for its security. The native Americans, or Indians, having experienced, in some provinces on that continent, much injustice, had made the most terrible reprisals: found policy, therefore, conspiring with his own temper and principles, made it Penn's care to have them treated with candour, justice, and humanity; and his relation, W. Markham, sailing with the first settlers, he joined him with others in a commission to open a friendly intercourse with the natives, to whom he sent out considerable presents, and a letter couched in plain conciliatory terms. In the beginning of 1682 he published "The Frame of the Government of the Province of Pennsylvania in America, together with certain Laws agreed upon in England, by the Governor and divers Freemen of the aforesaid Province, to be further explained and confirmed there by the first provincial council that shall be held, if they seem meet. In the preface to this work we have a sketch of his sentiments on the forms and substance of civil government. "That," he observes, "which makes a good government, must keep it such: to wit, men of wisdom and virtue; qualities that, because they descend not with worldly inheritances, *must be carefully propagated by a virtuous education of youth*:" and in order to give effect where he had power, to that great principle of good government, liberty of conscience, in behalf of which he and his friends at home so deeply suffered, he recognized it in the first article of his "Constitutions," and proceeded to establish it by the following "Law." "All persons living in the province who shall confess and acknowledge the one Almighty and Eternal God, to be the creator, upholder, and ruler of the world, and that hold themselves obliged in conscience to live peaceably and justly in civil society, shall in no ways be molested or prejudiced for their religious persuasion, or practice in matters of faith and worship, nor shall they be compelled, at any time, to frequent or maintain any religious worship, place, or ministry whatsoever." Having completed his preparations, the governor, early in the autumn of 1682, sailed for Pennsylvania; his family (of whom he took leave in a pathetic and instructive letter) remaining behind. He was accompanied by about an hundred persons, mostly Quakers, from his own neighbourhood: but of these the small-pox, which had been inadvertently carried on board, swept off no less than thirty. In other respects the voyage was prosperous, and passing up the Delaware, he was met by the colonists, consisting of English, Dutch, and Swedes, with demonstrations of satisfaction. Having landed at Newcastle October 24, he convened and addressed the inhabitants, received legal possession of the country, and renewed the magistrates' commissions. After paying a visit to New York, he met the first provincial assembly at Chester, on the Delaware, then called Upland. Here, in a session of three days, the territory ceded by the duke of York was annexed to the province; an act of settlement was confirmed; resident foreigners naturalized; and the laws, which had been formed in England, after some revision, passed in form. Penn now visited lord Baltimore in his government of Maryland; whence he returned to Coquannock (the future site of Philadelphia), and began to purchase lands of the natives. He now likewise first entered personally with them into that firm alliance of peace and good offices, and formed (to use their own symbol) that chain of friendship, which was to last as long as sun and moon endure. Certain it is that his strict observance of justice in paying them for the soil (which was their inheritance), and the interest he manifested, during many successive treaties, in their

real welfare, not only operated to secure this colony, for a long series of years, from hostile attacks, but implanted in the generous, though uncultivated mind of the American, a regard for *Onas* (Penn), and his children (the Quakers), which bids fair to be transmitted to the latest remains of the race.

Philadelphia, the capital of the province, was next to be laid out, of which, at the time of Penn's arrival, not a house was completed; the colonists having, in general, no better lodgings than caves, hollowed out of the high banks of the river: the very plot fixed on for the city was claimed by some Swedes, to whom the governor allowed a greater quantity of land in exchange. This city extending two miles in length and one in breadth, and abutting at each end on a navigable river, was now planned, with admirable boldness, convenience, and regularity, and laid out under the inspection of Thomas Holmes, surveyor-general to the province. Ere twelve months had elapsed, the rudiments of the future metropolis shewed themselves in about fourscore dwellings, the seats of freedom, peace, and industry. The governor dispatched his plan to the committee of the Free Society of Traders, accompanied with a description (the best extant of these times) of the country, its natural history, and aborigines: this description is inserted in the collection of his works before-mentioned. The first jury was impanelled here early in 1683; and one Pickering was tried, with others his accessaries, before the governor and council, and convicted of counterfeiting the Spanish silver money current in the province. His sentence discovers the same spirit of mildness and equity, which, at this day, constitutes the praise and the efficacy of the criminal code of Pennsylvania. He was to pay a fine of forty pounds towards the building of a court-house, standing committed till payment; find securities for his good behaviour; and make restitution, in good silver, to the holders of his base coin, *which, being first melted down, was to be restored to him*. Various legislative, economical, and religious measures, together with a tedious dispute with lord Baltimore, on the subject of the boundary line between this province and Maryland, continued to occupy Penn till about Midsummer 1684; when he found it needful, on various considerations, to return to England. His interest at court had declined during his absence: but it was now restored, upon the death of Charles II, by the accession of his more immediate patron James II. He made use of his influence for the relief of his friends, the Quakers, who still lay under the scourge of penal statutes; and for the gratuitous service of many others. In particular he exerted himself in favour of the measure at that time so much, though so insincerely, held out by the court, of universal liberty of conscience. In 1686 (as we learn from bishop Burnet), being in Holland, in the course of a tour to Germany, &c. he had several interviews on this subject with the prince of Orange, on behalf (though not as an accredited minister) of king James: but his proposal going so far as to abolish the tests, it was rejected, probably by Burnet's advice, who was then with the prince, and in his confidence. However freely we may excuse Penn, on the fair plea of gratitude, for his attachment to James, it is to be lamented that he gave implicit credit to pretended schemes of religious liberty, the duplicity of which was so fully penetrated by others. His intimate reception at court, and the appearance of being in some way trusted or employed by the king, now subjected him to the general imputation of being a concealed Papist. Even his old acquaintance, Dr. Tillotson (afterwards archbishop of Canterbury), suspected him; but some expressions of Tillotson's on the subject coming to Penn's ears, a correspondence ensued between them, at the close of which Tillotson acknowledged

ledged himself fully satisfied that there existed no just grounds for the surmise. About this time (besides a further account of his province) Penn published several pieces on his favourite topic, liberty of conscience, one of which was entitled "Good Advice to the Church of England, Roman Catholic, and Protestant Dissenter, in which it is endeavoured to be made appear, that it is their duty, principle, and interest to abolish the penal laws and tests."

The last occasion in which we have to view Penn in connection with the court of James, is in an occasional attendance on the movements of the latter, this year, through several of the midland counties. Penn seems to have made use of several intervals in this *progrès*, to pay religious visits to his friends, and to preach to the people. On some of the latter occasions the king, too, was present to hear him. At Oxford he remonstrated with James on his arbitrary treatment of the fellows of Magdalen college, and attempted a mediation between them and the king, which he farther prosecuted afterwards at Windsor; but it proved abortive.

The revolution brought Penn again into difficulties, as a suspected Papist, or Jesuit, and a secret agent for the old government. On the 10th of December 1688, walking in Whitehall, he was sent for by the lords of the council, then sitting, who, though nothing was laid to his charge, obliged him to give sureties for his appearance on the first day of the next term: he was continued on these to the Easter term following, on the last day of which he was cleared in open court. In 1690 he was again brought before the council, on an accusation of holding correspondence with the late king James; he appealed to king William, who, after a conference of near two hours, inclined to acquit him; but to please some of the council he was held upon bail for a while, and in Trinity term, of the same year, again discharged. He was yet a third time attacked, and his name inserted in a proclamation, dated July 18th this year, wherein (among divers of the nobility, and others, to the number of eighteen) he was charged with adhering to the king's enemies, but proof failing respecting him, he was again cleared by order of the court of king's bench. He now purposed to go again to his province, and gave out proposals for a new settlement there. It appears that though his stay in England might be necessary to the security of his title as proprietary, it was highly detrimental both to his interests in America, and, through deficiency hitherto of revenue from it, to his private estate. His order for convoy had already passed the secretary of state, when the voyage was prevented by a new charge against him, backed by the oath of one Fuller, a wretch who was afterwards declared by parliament an impostor: the charge, however, being that of partaking in a plot to restore the late king, a warrant was granted for his apprehension, which he narrowly escaped at his return from George Fox's burial, the 16th of the month called January 1690. Seeing now no probability of fair treatment, he retired (or, as Burnet chuses to say, absconded) for two or three years: during which time, besides a preface to the collected works of Barclay, he wrote the following pieces: 1. "Just Measures," an epistle to the Quakers in vindication of religious discipline: 2. "A Key," or a treatise explanatory of their principles and practice: 3. "Reflections and Maxims relating to the Conduct of Human Life:" the two latter of these have gone through many editions. At the close of 1693, being admitted through the intercession of some of the nobility to appear before the king and council, he now effectually repented his innocence, and got clear of this long political persecution. About this time his wife, who was an amiable and accomplished woman, died, and he married, after two years, Hannah, daughter of Thomas Callowhill, of Bristol; and

soon after lost, by a consumption, his eldest son, a promising youth, just of age. The interval from his appearing again in public, to the year 1699, appears to have been chiefly devoted to religious labours and controversies: he also presented to parliament some arguments for exempting Quakers from oaths; and some remarks on a bill against *blasphemy*, in which he very rationally proposed that the term should be so defined as to preclude malicious interpretations: this bill was dropped.

On the prevalence of Penn's enemies at court, he had been deprived of his government of Pennsylvania, which was annexed, in October 1692, to that of New York, under colonel Fletcher. The ostensible reasons for this step were mal-administration, and danger of the loss of the province thereupon: the real one probably was a jealousy excited by the growing prosperity of the colony, and by principles and practices in its jurisprudence too liberal for the age. Penn's rights were restored to him by an instrument of William and Mary, dated in August 1694, but it was not till five years after this, that he embarked a second time for the province, accompanied by his family. The vessel, being three months at sea, did not arrive at Philadelphia "until the beginning of the tenth month, 1699, when a dangerous and contagious distemper, called the *yellow fever*, having raged in the province, and carried off great numbers of people, had ceased." Penn seems now to have intended to spend the remainder of his life in America, and he applied himself diligently to the offices of government; in which the inevitable difficulties arising from a mixed population, of various dispositions and interests, and enjoying a great share of liberty, required the exercise of both skill and patience. His administration was successful, and the colony is stated to have been at this period, when compared with others of the same standing on the continent, in an easy and flourishing condition. His old allies, the natives, were not overlooked, and religion being ever a predominant consideration with Penn, he engaged his friends at a monthly meeting for discipline, held the beginning of 1700, in a plan for the instruction of the natives and of the negroes, who had now been introduced among them, in the principles of the Christian faith. Later experience has shewn that Christianity, to obtain a cordial and general reception among these people, should be preceded by her handmaid, civilization. A public school, (free to the children of the poor,) had been already founded here. In the second month 1701, a treaty was held between the governor and about forty of the chief persons among the natives, in which, besides renewing former covenants, the parties established some regulations on the subject of trade between them: a principal care of the governor, on this occasion, seems to have been to prevent the abominable practice, already used by some unworthy colonists, of drawing the natives into a ruinous traffic, by offering them spirituous liquors.

During these transactions an attempt was making, at home, under pretence of advancing the prerogatives of the crown, and of national benefit, to invade the several proprietary governments in America, and reduce them to regal ones. A bill for this purpose was already before the lords, when the land-owners of Pennsylvania, present in England, petitioned the house, and gained time for the governor's return; who, on notice of the measure, presently embarked, and arrived at Portsmouth in December 1701. The bill which had been postponed, was now entirely dropped, and the accession of queen Anne, soon after, placed Penn once more in the sunshine at court. His estate, however, had now suffered much, by liberal disbursements, by inadequate

returns,

returns, and by the continual political impediments thrown in his way. He was moreover involved, in 1707, in a suit at law with the executors of a person who had been his steward; and his case not admitting of relief by the court of chancery, he was obliged to live within the rules of the Fleet, until the dispute could be adjusted. Advantage was now taken of his embarrassments by the ministry, to endeavour to buy what was before to have been taken by an act of power. He demanded for his province 20,000*l.*, and, after some discussion, had agreed to accept of 12,000*l.*, when he was incapacitated by illness from completing the sale. This defect was to have been supplied by an act of parliament, and by the queen's order one was prepared. It now appeared, on the petition of Henry Gouldney and others, that Pennsylvania had actually been mortgaged to them by its proprietor in 1708, for the sum of 6600*l.*! Let us turn from this prospect: it is sickening to see public spirit and liberal enterprise reduced to the necessity of pawning and setting to sale its honourable fruits. The estate, however, was not sold, but continued in the hands of Penn, and the proprietaries, after the revolution in America, received from the legislature of Pennsylvania the sum of 130,000*l.* in lieu of their quit-rents, besides retaining many valuable tracts of land. They also received, by an act of the British parliament, a remuneration of 4000*l.* per annum, in consideration of their losses, and of the "meritorious services" of their ancestor.

For ten years after his return to Europe, Penn lived mostly near London, and was still active in religious and civil society. He wrote, in 1709, "Some Account of the Life and Writings of Bullrode Whitelocke, esq." This was published along with the "Memorials of English Affairs," written by that excellent man and statesman, with whom Penn had been for many years acquainted. In 1710, his health declining, he took a handsome seat at Rushcombe, near Twyford, Bucks. Here, in 1712, he was attacked with fits, supposed to be apoplectic, by which his understanding and memory were much impaired, and he became, in consequence, unfit for public action, though not insensible, as it appears, to the sympathy of his friends and the comforts of religion in a peaceful conscience. He died, after a gradual declension of six years, the 30th of the month called July 1718, and was interred at the Quaker's burial-ground, at Jordans, near Beaconsfield.

One of the ablest and best informed of Penn's contemporaries, Burnet, in his history of his own times, has exhibited him, on several occasions, to some disadvantage, both as a man and a citizen. That he should no where report any good of a person so eminent might justly excite our surprize, were it not apparent that Penn was, on several accounts, odious to this historian: we must therefore receive the little he is pleased to say concerning him, with due allowance for the effect of party prejudice. That Penn was a perfect, or a faultless character, will not, by his warmest friends, be pretended. He appears to have wanted discernment in his estimate of affairs at home: but in his policy abroad, where he moved without shackles, there is a soundness of principle, and a dignity of feeling, that make ample amends for this defect: his integrity was evinced through many severe trials: his errors may be pronounced a fraction of no moment, when set against the great sum of good, of which, under the Author of every good gift, he was the conscious and the willing donor to mankind. Penn's Life, prefixed to his Works, in folio. Sewell's History of the Quakers. Proud's History of Pennsylvania.

PENN'S Cove, in *Geography*, a bay on the E. coast of

Whidbey's island, in the gulf of Georgia. N. lat. 48° 16'. E. long. 237° 39'.

PENN'S Creek, a river of Pennsylvania, which runs into the Susquehannah, N. lat. 40° 48'. W. long. 76° 56'.

PENN, Fort, lies at the mouth of a small creek, on the W. side of Delaware river, in Northampton county, about 21 miles N. of the line of Ealton, and near 70 miles N. of Philadelphia. N. lat. 40° 59'. W. long. 75° 13'.

PENN, Port, lies in Newcastle county, Delaware, on the W. bank of Delaware river, opposite to Reedy island.

PENN'S, a township of Pennsylvania, on the river Susquehannah, containing 2309 inhabitants.

PENN'S Neck, a town of Salem county, New Jersey, in Old Man's creek; 12 miles N.E. by N. of Salem.—Also, the name of a range of farms of excellent soil, situated about one mile and a half S.E. of Princeton, in New Jersey, on a point of land formed by Millstone river, and Stony creek; so called from the celebrated William Penn, who formerly owned this tract.

PENNA, LORENZO, in *Biography*, an ecclesiastic of Bologna, published a work entitled, "Li primi albori Musicali. per li principianti della Musica figurata;" one of the best treatises on practical music that appeared in Italy during the 17th century. The first sketch of this book was published in 1656. A second edition, enlarged, of the first book, appeared at Bologna, 1674. The second book at Venice, 1678: and the whole completed, in three books, 1684. In 1696, the work had gone through five editions. The author's rules for counterpoint, and extemporary playing on keyed instruments, are concise and clear, as far as they go; which is, however, very short of what is now wanted, since the bounds of modulation and use of discords have been so much extended.

PENNA, in *Geography*, a town of Italy, in the marquise of Ancona; 9 miles E. of Camerina.

PENNA d'Agber, *Is.*, a small island near the W. coast of Sardinia. N. lat. 43° 33'. E. long. 8° 16'.

PENNA di Billi, a town of Italy, in the duchy of Urbino, the see of a bishop; 14 miles W.N.W. of Urbino.

PENNANT, THOMAS, in *Biography*, celebrated as a naturalist and tourist, to whose various writings we have had frequent recourse in our researches in the several departments of natural history, was born at Downiag, in Flintshire, in the year 1726. He received his school education at Wrexham and Fulham, and from the latter place he was removed to the university of Oxford, where he entered upon the study of jurisprudence, though, probably, without any intention of pursuing the law as a profession. A present made to him, when he was about 12 years old, gave him a taste for the studies and pursuits in natural history, for which he afterwards became famous. In the year 1746 he made a tour into Cornwall, in the course of which he became acquainted with Dr. Borlase, and thus acquired a sort of passion for the science of mineralogy. In the year 1754 he was elected a fellow of the Society of Antiquaries, which was highly gratifying to him, as he had always been accustomed to combine antiquarian studies with his researches into nature. His first effort as an author, in the department of natural history, was a paper on certain coralloid bodies found in Coalbrookdale, which was inserted in the Philosophical Transactions for the year 1756. He had previously to this commenced a correspondence with the illustrious Linnæus, to whom he sent an account of a *concha anomia* from the Norwegian seas, and in return he was made a member of the Royal Society of Upsal. About this time Mr. Pennant married, and passed some years in domestic retirement. By way of occupation he began, in 1761, to prepare

prepare his British Zoology, in 132 coloured plates, imperial folio, with explanations. This work he afterwards published for the benefit of the Welsh charity-school in London. In 1763 he came into possession of the estate of Downing, and with it a rich mine of lead-ore, which enabled him to make great improvements. The death of his wife interrupted his domestic enjoyments, and in the Spring of 1765 he made a tour to the continent, and visited Switzerland, part of Germany, and Holland, and acquired an intimacy and friendship with several persons of great scientific knowledge, among whom were Buffon, Haller, the Gesners, Gronovius, and Pallas. His conference with the latter at the Hague gave rise to the plan of his "Synopsis of Quadrupeds." In 1767 he was elected a fellow of the Royal Society of London, and in the next year he republished his British Zoology, in two vols. 8vo., and in 1769 a third was added, including fishes and reptiles. In the same year he took a journey to the remotest point of Scotland, and the observations which he made were afterwards the basis of a very interesting publication. In 1770 he published 103 additional plates to his British Zoology, with several new descriptions, and in the following year he printed his Synopsis of Quadrupeds, in one volume 8vo. His well-earned reputation caused him to be presented, by his Alma Mater, with the compliment of the degree of Doctor of Laws. The account of his first Tour to Scotland was well received by the literary world, for previously to this little was known of Scotland by the people of England; and the valuable and well-arranged facts given by this excellent traveller, were highly prized by persons on both sides of the Tweed. In 1772 he repeated his northern tour, extending it to the Hebrides, the result of which was a rich harvest of valuable and entertaining observations. In the following year he published "Genera of Birds," in one volume, and employed himself in a journey through the northern counties of England.

Mr. Pennant was now become an habitual traveller, and he found his excursions equally conducive to the health of his body and vigour of his mind. In all his tours he laid up new stores of information, and he found even the most frequented tracts fertile of those topographical memoranda to which his attention was principally directed. In 1778 he gave the public an account of his native country, Wales, in a work entitled "A Tour in Wales," and in 1781 he added another volume, with the title of "A Journey to Snowden." These are particularly interesting, on account of the many anecdotes interspersed illustrative of the manners and history of that part of the island. He did not neglect his original object of pursuit, Natural History. He had, in the year 1777, added a volume to his British Zoology, containing the Vermes, Testaceous and Crustaceous animals. In 1781 he published his "History of Quadrupeds," and in the same year his "History and Natural History of the Turkey" was inserted in the Philosophical Transactions. His "Arctic Zoology," in two vols. 4to. appeared in 1785. To this there was a copious introduction, which is thought to be the most interesting and original of all his writings. It is a kind of survey of all the coasts of the arctic regions, beginning from the Straits of Dover, and proceeding to the remotest north, on the east and west, and filled with a great variety of geographical, historical, and physical facts, affording a series of the most animated pictures. In 1782 he published "A Journey from Chester to London;" and also an account of the antiquities of the capital itself, entitled "London." Several smaller pieces of the political and miscellaneous kind filled up the intervals of his greater works, and proved the continued activity of his mind.

These facts are chiefly taken from the history of his literary life by himself, which was printed in the year 1793. After which he published a natural history of the parishes of Holywell and Downing, within the latter of which he resided more than 50 years. Not long before his death appeared another work, in two volumes 4to., which was entitled "A View of Hindooſtan," which was executed in an able manner, and which bears a strong resemblance to the introduction to the "Arctic Zoology." He died at his seat at Downing in the year 1798, in the 72d year of his age. He inherited from nature a strong and vigorous constitution; his countenance was open and intelligent; his disposition active and cheerful; and his vivacity, both in writing and conversation, rendered him, at all times, an entertaining companion. He was exemplary in the relations of domestic life, zealously attached to the interests of his country, both local and general, and kindly attentive to the wants of his poor neighbours. As an author his style is lively, and well adapted to convey the ideas which he intended to express, but it is not always correct. In the department of natural history he is clear and judicious in his principles of arrangement, concise, energetic, and exact in his descriptions. His facts are regarded as of good authority.

PENNANT, or *Pendant*, in a *Ship*. See PENDANT.

PENNANTIA, in *Botany*, was so named by Forster, in honour of his friend and patron the late Thomas Pennant esq. of Downing, Flintshire, the great British zoologist, who in his various publications has incidentally touched on botany in many places, and who published in his various tours the first British figures of some of our rarest plants. Forst. Gen. t. 67. Schreb. 739. Mart. Mill. Dist. v. 3. Juss. 428. Lamæck Illustr. t. 854.—Class and order, *Polygamia Dioecia*, rather *Pentandria Monogynia*. Nat. Ord. uncertain; perhaps akin to the *Urtica* of Jusseu.

Gen. Ch. *Cal.* none, unless the corolla be taken for such. *Cor.* Petals five, equal, lanceolate, acute, concave, widely spreading. *Stam.* Filaments five, capillary, the length of the petals; anthers oblong, incumbent. *Pist.* Germen superior, obtusely triangular; style none; stigma flat, peltate, obscurely three-lobed. *Peric.* Capsule? triangular, of two cells. *Seeds* solitary, somewhat triangular.

Some flowers, on a separate plant, have the filaments twice as long as in the above, with ovate anthers, but no pistil.

Ess. Ch. Calyx none. Petals five, equal. Style none. Capsule? of two cells. Seeds solitary.

1. *P. corymbosa*. Forst Prodr. 75.—Native of New Zealand.—A tree or shrub, with round leafy branches, dotted, and somewhat downy, when young. *Leaves* alternate, flaked, two inches or rather more in length, obovate, either quite entire, or with two or three broad, blunt, shallow teeth or small lobes; furnished with a mid-rib, and many transverse interbranching veins; dark green above, nearly smooth, except the rib, which is on both sides minutely hairy; pale and smooth beneath. *Footstalks* not half an inch long, channelled, hairy. *Stipulas* minute, oblong, concave, membranous, very soon falling off. *Corymbs* terminal, much branched, many-flowered, hairy; the branches mostly alternate. *Flowers* about the size of *Laurus tinus*; as far as can be judged of them in a dry state, they seem to be pale green or yellowish-white. The whole specimen bears a general resemblance to some kind of *Viburnum*, but the absence of a calyx is a striking difference. Such is Forster's original specimen before us. The younger Linnaeus however obtained in England, if we mistake not, a specimen under the name of *Pennantia*, which is a very different

ferent thing. The *leaves* are ovate, four inches long, green on both sides, undivided and entire. *Branches* and *footstalks* smooth, with a solitary stalked gland at a little distance above each of the latter, and no *stipulas*. *Flowers* numerous, in a terminal, compound, smooth cluster; their *style* as long as the *corolla*, their *filaments* longer, and, what is most remarkable, each *flower* has a *calyx*, deeply divided into five ovate fringed segments, and rather elongated at its base. This plant therefore is unquestionably altogether different from Forster's *Pennantia*; it may be an *Ehretia*, but we know nothing of the fruit, nor is it to our present purpose to investigate this question. The true *Pennantia* above described has so much resemblance in some points to the order of *Urtica*, that we venture to hint its probable affinity thereto. Possibly the supposed *corolla* of five petals may be a deeply divided *calyx*. As to the true nature of the *fruit*, nothing certain is known. Forster examined the *germen* only, and though we allow that the rudiments of two cells is a circumstance much against our conjecture, we conceive there are not sufficient materials to lead us to any other safe conclusion.

PENNAR, in *Geography*, a river of Hindoostan, which rises in Mysore, traverses the circuit of Cuddapa and the Carnatic, and runs into the bay of Bengal, 12 miles E. of Nellore. N. lat. 12° 26'. E. long. 80° 13'.

PENNARE POINT, a cape in the English channel, on the S. coast of Cornwall; 6 miles W.S.W. of Dedman's point. N. lat. 50° 12'. W. long. 4° 46'.

PENNARTH BAY, a bay on the S. coast of Wales, in the Severn, at the mouth of the Taf, below Cardiff. A point of land, called Pennarth point, bounds it on the south.

PENNAS, LAS, a town of Peru, in the diocese of La Paz; 70 miles N. of Potosi.

PENNATA FOLIA, winged leaves, among *Botanists*, are such leaves of plants as grow directly one against another, on the same rib or stalk: as those of the ash, walnut-tree, &c. See **LEAF**.

PENNATULA, or **SEA-PEN**, in *Natural History*, a genus of the class and order Vermes Zoophyta. The generic character is as follows: animal not affixed, of various shapes, supported by a bony part within, naked at the base, the upper part with generally lateral ramifications, furnished with rows of tubular denticles, producing radiate polypes from each tube. There are eighteen

Species.

COCCINEA. The stem is round, radiating, with papillous polype-bearing sides, and clavate at the top. It inhabits the deeps of the White sea, and unites the two genera Alcyonium and Pennatula; it is soft, red, an inch and half high, and as thick as the little finger; it is wrinkled, with the papillæ disposed in rows.

GRISEA. Stem fleshy, with a smooth midrib and imbricate plated spinous ramifications. It is found in the Adriatic, and is about eight inches long; it shines by night; back of the midrib lanceolate, smoothish; rays imbricate, and undulate on the anterior margin, the lobules are armed with a spine, and obtusely crenate at the margin.

PHOSPHOREA. Stem fleshy, with a rough midrib and imbricate ramifications. It inhabits most seas, and emits a strong phosphoric light in the dark; it is about four inches long, and red; the stem is villous, with a lanceolate rough midrib, and nearly incumbent rays, the tubes pointing all one way.

FILOSA. The stem is a little fleshy, with a rib feathered on each side, and furnished with two filiform tentacula at the

base. It inhabits European seas, and is from four to six inches long.

RUBRA. Stem fleshy, with a broad, tuberculate midrib, the ramifications are imbricate, with each a short spine at the base. It inhabits the Mediterranean, is about six inches long; in colour it is whitish, varied with red dots and fassron lines.

MIRABILIS. Stem filiform, with lunate, distant, alternate ramifications. It inhabits the American, the Atlantic, and Norwegian seas; is about three or four inches long, and is fulvous; the tubes are round, with a spinous tip.

SAGITTA. Stem filiform, with close-set ramifications, and naked at the tip. It inhabits the ocean, and is thought not to be a distinct species.

ANTENNINA. Stem nearly quadrangular, fetaceous, with polype-suckers, on three sides. It inhabits the Mediterranean; is two feet ten inches high, and with regard to colour it is yellowish dotted with red.

STELLIFERA. Simple, equal, with solitary polypes towards the tip. It inhabits the Norway seas, and is about four inches long.

PHALLOIDES. Simple, with a cylindrical midrib every where covered with polypes. It inhabits the Indian ocean, is six inches long, and grey.

ARUNDINACEA. Stem quadrangular and very long. It inhabits the Norway seas, and is four feet long; the stem is linear, with cylindrical rays of solitary tubes, which are deciduous, erect, crowded, and seated on a thin pedicle.

SCIRPEA. This is simple, linear, tapering, with a round midrib producing polypes on one side. It inhabits the ocean, and is eighteen inches long; the stem is fleshy, thicker and longer than the midrib; the bone is somewhat flexile.

JUNCEA. Simple, linear, with a truncate rib, and transverse polype bearing wrinkles on each side. This is found in the Indian ocean, is two feet long, white, beneath horny, the rays mixed, fulvous and white.

GRANDIS. Pen-shaped, linear-lanceolate, with a smooth round stem, and jagged toothed ramifications. It inhabits the Indian ocean; is a foot long, greenish-grey, shines with a cinereous light in the dark, and sometimes stings the hand if it be touched.

ARGENTEA. Pen-shaped, lanceolate, with a smooth round stem, and very close-set imbricate, striate ramifications. This also is found in the Indian ocean, and is about a foot long; in colour it is a rich, silvery white, elegantly striate along the ramifications with lines of black; like many of the tribe it is luminous in the dark.

ENCRINUS. Stem quadrangular, taper, very long, bony, covered with a callous membrane, with an umbellate cluster of polypes from the top. It inhabits the Greenland seas, is about six feet long, and when taken fresh from the sea, appears like a nosegay of yellow flowers.

CYNOMORIUM. Cylindrical, fleshy, somewhat clavate, bearing polypes on the whole upper surface. It inhabits the Mediterranean, is reddish, and about four inches long.

RENIFORMIS. Stem round, verrucular, supporting a kidney-shaped leaf-like head, producing polypes on one surface. It is found in South Carolina. The body is expanded, kidney-shaped, flat, rising from a short stem, and covered on the upper surface with numerous tubular orifices, through which the polypes are protruded at pleasure; the upper surface is of a rich purple, the under side less brilliant, and sometimes yellowish.

PENNE, in *Geography*, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the district of Villeneuve d'Agen; 3 miles E. of it.

The

The place contains 854, and the canton 10,621 inhabitants, on a territory of 162½ kilometres, in 22 communes.

PENNEDO *de St. Pedro*, a small island in the Atlantic. N. lat. 0° 55'. W. long. 27° 10'.

PENNEVISCH, in *Ichthyology*, a name given by some to the most common species of the fish called *bagre*, caught in the East and West Indies.

PENNEWANG, in *Geography*, a town of Austria; three miles N. of Schwanauadt.

PENNI, GIOVANNI FRANCESCO, called *Il Fattore*, or the steward, from having been entrusted with the domestic concerns of Raphael, in *Biography*, soon became one of his principal assistants. He more than any other helped him in the execution of the cartoons of the Arazzi, and in the Loggii of the Vatican painted the histories of Abraham and Isaac. After the death of his master, he executed the fresco of the coronation in the Stanza of Constantine. The upper part of the Assumption of the Virgin at Monte Lupi, in Perugia, is ascribed to him, but the lower part was painted by Julio Romano. Few of his own works remain. Facility of conception, grace of execution, and a singular felicity in landscape, are mentioned as his characteristics.

Penni wished much to have united himself with his co-heir Julio, but being coldly received by him at Mantua, went to Naples, where his works and principles might have contributed much towards the renown of his name, had he not been intercepted by death, in the year 1528, at the age of 40. Fuseli's Pilkington.

PENNIGONDA, in *Geography*, a town of Hindoostan, in the circar of Rajamundry; 38 miles E. of Rajamundry.

PENNING, in *Commerce*, a money of account in Holland. The gilder, or florin, contains 20 stivers, and each of these is subdivided into 16 pennings; the six-dollar is = 800 pennings; 2 pennings are = a duyts, and 8 duyts = 2 groots Flemish = a stiver.

PENNINGTON, ISAAC, in *Biography*, a member of the society of friends, and a considerable writer among that people, was the son of an alderman of London, who repeatedly filled the office of chief magistrate, was a noted member of the Long Parliament, and nominated one of the judges of king Charles I., though he did not take his seat among them. Isaac was born about the year 1617, and having the prospect of succeeding to a large estate, he was furnished with the means of obtaining the best education. As he grew up, he had, from his father's situation in life, opportunities of mixing with some of the most considerable men of the age, and if he had been of an ambitious turn of mind, he might have occasionally indulged hopes of rising very high in the world. But from a very early age he was under strong religious impressions, and as he grew up to manhood, discovered an increasing attachment to retirement, serious contemplation, and the reading of the scriptures. While he was in this state of mind, he met with some of the writings of the Friends, "which," says he, "I cast an eye upon and disdained, as falling very short of that wisdom, light, life, and power which I was searching after." There was, however, something in them that roused his attention, and he went to one of their public meetings, at which George Fox preached, whose discourse produced on him a sudden and complete conversion to the principles of the new sect. From this time he joined the society in opposition to the influence of his connections, as well as unmoved at the prospect of reproaches and losses to which his profession would unquestionably expose him. In the years 1661 and 1662, Mr. Pennington was called forth to be a confessor for the profession which he had embraced. For the crime, as it was called, of holding

meetings of Friends for the worship of God in his own house, he was committed to Aylesbury gaol, where he was kept in close custody for seventeen weeks, great part of which was in the winter season; and to aggravate the severity of his treatment, he was confined in a cold and very inconvenient room, without a chimney, by which cruel usage he contracted so violent a disorder, that for several weeks after his release he was not able to turn himself in his bed. From this time till the year 1679, he suffered six different imprisonments. These repeated calamities, together with heavy pecuniary losses, arising, in many instances, from the confiscation of his property, to discharge the oppressive fines which were levied upon him, Mr. Pennington sustained with firmness and serenity, believing himself to be a sufferer for obeying God rather than man. With the same equanimity and fortitude he bore the attacks of a painful distemper, which terminated his life in the year 1679, in the 63d year of his age. His character procured him the respect and esteem of all good men, as it exhibited an excellent pattern of piety, virtue, and the strictest morality. He was most faithful in the discharge of all the duties of life, and was author of numerous writings, which were highly prized by the people with whom he associated. They were collected and published in a folio volume in 1681. They have since been reprinted in 4to. and 8vo., and in the year 1796, some of his "Letters" were published.

PENNINGTON, or *Pennytown*, in *Geography*, a pleasant and flourishing village in Hunterden county, New Jersey; 9 miles W. of Princeton, containing a church and about 42 houses.

PENNISETUM, in *Botany*, so called by Richard, from *penna*, a feather, and *seta*, a bristle; Richard in Perf. Syn. v. 1. 72. Brown Prodr. Nov. Holl. v. 1. 195. (See PANICUM.) The name alludes to the feathery structure of the bristles which compose the involucre.

PENNON, or PENON, a standard with a triangular tail, anciently borne before knights bachelors, who brought a certain number of followers into the field. Some instances occur of pennons being carried before esquires, but they were only such as possessed certain estates or fiefs; or who could bring a sufficient suite of vassals into the field. The pennon was in figure and size like a banner, which was small and of a square figure, with the addition of a triangular point. They were charged with armorial bearing of their owner. On the performance of any gallant action by the knight and his followers, the pennon was converted into a banner by the king, or commander-in-chief, cutting off the point, by which the knight was raised to the degree of a banneret. Both knights and bannerets were bound to appear in the field at the head of a certain number of men, whence ancient historians frequently express the strength of an army by the number of banners and pennons of which it consisted.

PENNSBOROUGH, WEST, in *Geography*, a town of America, in Cumberland county, Pennsylvania; famous for a remarkable flow of water from a ridge of lime-stone, called "The Big Spring," which, after turning six mills, discharges itself through Conidogwinnet creek into the Susquehannah.

PENNSBOROUGH, *East*, a township in the same county. PENNSBURY, a small town of Pennsylvania, in Bucks county, on a small creek of Delaware river. This was a manor which Mr. Penn reserved for himself, where he built a house, and planted orchards and gardens; which, with many additional buildings and improvements, still continue.

PENNSYLVANIA, one of the principal provinces of the United States of America, extending in length 228, and

PENNSYLVANIA.

and in breadth 156 miles, between 39° 43' and 42° N. lat. and 74° 48' and 80° 8' W. long. and comprehending 46,000 square miles. It is bounded E. by Delaware river, which divides it from New Jersey; N. by New York and lake Erie; N.W. by a part of lake Erie, where is a good port; W. by the state of Ohio and a part of Virginia; S. by Virginia, Maryland, and Delaware. The figure of this state is a parallelogram, if we except the N.W. corner of this state, containing about 202,000 acres, lately purchased of Congress by the states. In the year 1800 Pennsylvania was divided into thirty-five counties, as in the following Table :

Counties.	No. of Towns.	No. of Inhabitants.	Chief Towns.	No. of Inhabitants.
City and County } of Philadelphia }	18	81,009	Philadelphia	41,220*
Montgomery	28	24,150	Norristown	922
Bucks	28	27,496	Newtown	781
Delaware	21	12,809	Chester	957
Chester	40	32,093	West-Chester	374
Lancaster	25	43,403	Lancaster	4,292
Berks	35	32,407	Reading	2,886
Northampton	30	30,062	Easton	1,055
Luzerne	19	12,839	Wilkesburg	835
Dauphin	12	22,270	Harrisburg	1,472
Northumberland	24	27,797	Sunbury	613
Wayne	9	2,562		
Adams	16	13,172	Gettysburg	
Alleghany	16	15,087	Pittsburg	1,565
Armstrong	3	2,399		
Beaver	6	5,776	Beaverton	
Bedford	12	12,039	Bedford	
Butler	4	3,916		
Crawford	2	2,346	Meadville	
Cumberland	18	25,386	Carlisle	2,032
Fayette	17	20,159	Union	1,719
Franklin	14	10,638	Chamberston	
Green	10	8,605	Waynesboro'	
Huntingdon	18	13,008	Huntingdon	1,251
Lycoming	10	5,414	Williamport	
Mercer		3,220		
Mifflin & Center	12	13,609	{ Lewisburg & Bellefont	
Somerset	13	10,188	Somerset	
Venango	2	1,130	Franklin	
Warren	1	233	Warren	
Washington	22	28,298	Washington	
Westmoreland	14	22,726	Greensburgh	
York	18	25,643	York	
Erie	6	1,468	Erie	
Total 35	523	602,545		

* The suburbs contain 39,789 inhabitants.

A new census having taken place since the above table was formed, some of the statements admit of considerable alteration. The interruption of intercourse between the two countries has prevented our obtaining this census; but as soon as it is received, the necessary corrections shall be made.

The total number of acres in all the counties is reckoned at 29,634,840; and a great portion of the state is divided into townships, in each of which the freemen assemble annually to chuse overseers of the poor, assessors, a collector, supervisors of roads, and a constable. The number of inhabitants, which is 602,545, includes 1706 slaves. In this

state are six considerable rivers, viz. the Delaware, Schuylkill, Susquehannah, Youghiogeny, Monongahela, and Alleghany. The only swamps, worthy of notice, are the Great Swamp, between Northampton and Luzerne counties, and Buffalo Swamp, near the head waters of the Susquehannah. These swamps are found, upon examination, to be bodies of firm land, thickly covered with beech and sugar maple. A considerable proportion of this state may be reckoned mountainous. The principal ridges, in the great range of Alleghany mountains, comprehended in Pennsylvania, are the Kittatinny, or Blue mountains. Behind these, and nearly parallel to them, are Peters, Tuscarora, and Neshocope mountains, on the E. of the Susquehannah; and on the W. Sharemon's hills, Sideling hills, Ragged, Great Warriors, Evits and Will's mountains; then the great Alleghany ridge, which being the largest gives name to the whole range; and W. of this are the Chefnut ridges. Between the Juniata and the W. branch of the Susquehannah are Jacks, Tuffys, Nittiny, and Bald Eagle mountains. The vales between these mountains are generally of a rich, black soil, suited to the various kinds of grafs and grains. Some of the mountains admit of cultivation almost to their summits. The other parts of the state are generally level, or agreeably variegated with hills and vallies.

The soil of Pennsylvania is of various kinds; in some parts it is barren; but a great proportion of the state is good land, and no inconsiderable part of it is very good. In general, however, the soil is more fit for grain than for grafs. This state includes the greater part of the kinds of trees, shrubs, and plants, that grow within the United States. Oaks of several species form the chief bulk of the woods. Hickory and walnut are also more abundant than in the northern states. Sassafras, mulberry, and tulip or poplar trees are frequent and thriving. The Magnolia glauca grows in low grounds; and the acuminata attains to great height about the western mountains. Grapes are common; and some of them, mellowed by froit, with the addition of sugar, make good wine. The white pine and white cedar grow well in some parts; and also red cedars are not rare in high grounds. The sugar maple is plentiful in the western and northern parts of the state, and the inhabitants are supplied from them with a considerable quantity of sugar.

Iron ore is distributed in large quantities through various parts of the state; and in some places appear copper, lead, and alum. Here are also limestone quarries, and various kinds of marble. In the middle and western country is abundance of coal. In the new settlements of the country there are large flocks of wild turkies. Partridges are numerous; pheasants are dear; and grouse are found in some districts. In the cold season pigeons migrate from the north in large numbers. In spring and autumn, several kinds of ducks, and some wild geese, are found on the rivers. The singing birds migrate to Pennsylvania from the north and south in certain seasons, and are numerous. In the rivulets trouts are common; in the eastern rivers the principal fish are roch, shad, and herring, which, in the spring, come from the sea in large shoals. In the western waters are a species of catfish, weighing from 50 to 100 pounds, and also yellow perch and pike, which are large and numerous.

Among the useful quadrupeds in the new districts are deer in great number, beavers, otters, racoons, and monkeys. Buffaloes rarely cross the Ohio, and elks seldom advance from the north. Panthers, wild cats, bears, foxes, and wolves, are not rare; the fur of all which is valuable. In the north settlements rabbits and squirrels are frequent; in the marshes are minks and musk-rats: but opossums and ground hogs are rare. The best settled land is on the south

PENNSYLVANIA.

side of Pennsylvania; which is owing to the roads that have been formed in this part of the country and adjacent districts. The principal article of agricultural cultivation is wheat. The next in value is Indian corn. Buck-wheat, rye, barley, and oats, are also cultivated. As are also German spelts, chiefly as food for horses. Potatoes are plentiful; and also turnips, cabbage, parsneps, and carrots, and the small oval pea. The culture of meadows is a considerable object in this state; those on the rivers are banked, drained, tusked, ploughed, and harrowed; and sown with Timothy grass and clover. The summer is long enough to admit of two mowings, and even three in rich ground. On farms that have springs and streams, dairies are built over them so as to place the milk-vessels in the water, which is necessary to avoid the injurious effects of heat. Horses, it is said, are raised beyond the proper use, as oxen might more generally supply their place. The best for teams are bred in Lancaster county; and the elegant saddle and coach horses have more or less of the blood of stallions imported from England. The number of sheep is considerable, and increases. Hogs, supplied with food from the woods of oak and beech, exceed home consumption. Mules and asses are hitherto very rare. Poultry are abundant, and turkeys are cheap. Flax and hemp are cultivated; the growth of hops is inconsiderable: bees are objects of attention. In favourable seasons, cherries, apples, and cider abound. Some attempts have been lately made about eleven miles from Philadelphia for the plantation of vineyards. Improved farms and roomy lots in the country towns have gardens, which supply common vegetables, fruits, and flowers.

The general style of architecture in this state is neat and solid. Stone buildings are most common in the old settlements; log and frame-houses in the new. Towns have a considerable proportion of brick houses: shingles cover the roofs. Necessary tradesmen and mechanics are settled on small farms or lots throughout the improved country, and also in villages. Manufacturers dwell chiefly in towns, though many of them are scattered through the country. The product of domestic female industry is considerable. The wives and daughters of even opulent farmers knit and spin; and in the towns, some females of higher rank do the same. Woollen stockings are made in sufficient quantity for use; and hemp, which is used in several places for coarse wearing apparel, bags, lines and nets, &c. is manufactured, in large quantities, into cordage, cables, and ropes. Iron works are of long standing, and are in an improving condition. The furnaces are 16, and the forges 37. The sitting and rolling-mills are said to cut and roll 1500 tons *per annum*. The fabricated articles are numerous, and of all the common kinds. Manufactories of leather, skins, and fur, are very extensive and good. The most respectable trades employed in materials of wood are cabinet-making, house-carpentry, coach-making, and ship-building. The port of Philadelphia is said to be among the first in the world for naval architecture. Paper of most kinds form a beneficial branch of manufacture, in which are employed above 50 mills, the annual product of which is computed at 25,000 dollars. Manufactories in stone, clay, and fossils, are bricks, and various pieces of marble, common earthen ware, grind-stones, and mill-stones. Pot and pearl-ashes are gradually advancing; tin-wares are well executed for various domestic purposes. Copper, brass, lead, and pewters are also the materials of various manufactured articles. A considerable quantity of cotton is wrought in families; linens imported are now printed; sugar refineries, and distilleries of molasses, and various preparations of tobacco, furnish employment for many hands. The manufactures of

Pennsylvania are said to have greatly increased within a few years, partly by the immigration of workmen from abroad, as well as by the skill and industry of the natives. Several new machineries have been lately set up at Philadelphia, and in some other places.

The commerce of Pennsylvania with the eastern and northern states, is, in great part, an exchange of staple commodities; which are too numerous to be recited. The commerce of Pennsylvania with the west is carried on by the Ohio with the Spanish, and by the lakes with the British dominions; and both ways with the Indian tribes. At present nearly the whole foreign commerce is carried on by the port of Philadelphia. The value of the exports from this state in the year ending September 30, 1791, was 3,436,092 dollars, 58 cents; in 1792, 3,820,662 dollars; in 1793, 6,958,836 dollars; in 1794, 6,643,092 dollars; in 1795, 11,528,260 dollars; in 1799, 12,431,967 dollars; in 1801, 17,438,193 dollars; in 1804, 11,030,157 dollars. The importation is very great, both for the consumption of Pennsylvania, and of the districts supplied from Philadelphia: common and fine imported linens and woollens are used to a great amount, notwithstanding the quantity of home-made; much Swedish iron and Russian hemp is imported; and English hard-ware is in great demand. The tonnage of this state amounted, in 1796, to 98,237 tons; in 1799, to 93,824 tons.

The population of this state (for which see the Table) is, according to the census of 1800, more than 13 for every square mile. The inhabitants are principally the descendants of English, Irish, and Germans, with some Scotch, Welsh, Swedes, and a few Dutch. The Friends and Episcopalians are chiefly of English extraction, and compose about one-third of the inhabitants. The Germans compose about one-quarter of the inhabitants of Pennsylvania: they consist of Lutherans (who are the most numerous), Calvinists or the Reformed church, Moravians, Catholics, Mennonists, Dutch Baptists (corruptly called Tunkers and Dunkers, by way of reproach), and Zwingfelters, who are a species of Quakers. They are all distinguished for their temperance, industry, and economy. The Baptists (except the Mennonist and Dutch Baptists) are chiefly the descendants of emigrants from Wales, and are not numerous. The original Swedes went over in the year 1638, as a colony, under the government and protection of Sweden. Few Swedes have since settled in America: and their language is nearly extinct. These people uniformly had the character of probity, mildness and hospitality; but have been careless of their lands and interest. A privilege, almost peculiar to this state, has been granted to foreigners by the legislature; *viz.* that of buying and holding lands and houses within this commonwealth, without relinquishing their allegiance to the country in which they were born.

The character of the Pennsylvanians is naturally diversified by difference of extraction, various degrees of education, and of opulence.

The congregations of the different denominations of Christians in Pennsylvania are as follow; *viz.* Presbyterians, 86 congregations; German Calvinists, 84; German Lutherans, 84; Friends or Quakers, 54; Episcopalians, 26; Baptists, 15; Roman Catholics, 11; Scotch Presbyterians, 8; Moravians, 8; Free Quakers, 1; Universalists, 1; Covenanters, 1; Methodists, several; besides a Jewish synagogue; amounting in all to about 400 religious societies. Religious liberty was formerly on a more respectable establishment in this state than in the other parts of America. But even here it was imperfect till the late revolution; for Roman Catholics and Jews were excluded from a share in the government. The latter continued under this disadvantage,

PENNSYLVANIA.

tage, until the new constitution gave them, and all people of whatever nation or religion, unlimited liberty of conscience, with capacity for all civil rights and privileges.

The military strength of this country consisted, in 1799, of 93,221 men.

Pennsylvania abounds with literary, humane, and other useful institutions more than any other of the American States. We shall here merely enumerate them, and mention the time of their institution. They are the American Philosophical Society, formed in 1769 (see SOCIETY); the Society for promoting Political Inquiries, instituted in February 1787; the College of Physicians, instituted in the same year, and incorporated in 1789; the Pennsylvania Hospital, established in 1751; Philadelphia Dispensary, instituted in 1786; the Pennsylvania Society for the Abolition of Slavery and the Relief of free Negroes unlawfully held in bondage, begun in 1774 and enlarged in 1787; the Society for alleviating the Miseries of Prisons, which is become a regular work-house with an annexed place of confinement; the Society of United Brethren for propagating the Gospel among the Heathens, instituted in 1787; the Pennsylvania Society for the Encouragement of Manufactures and useful Arts, instituted in 1787; the Philadelphia Society for the Information and Assistance of Persons emigrating from foreign Countries, instituted in 1794. Besides these there are two insurance companies, an humane society, for the recovery of drowned persons, instituted in 1770; an agricultural society, a society for the relief of German, and another for the relief of Irish emigrants, a marine society, a charitable society for the support of widows and families of Presbyterian clergymen, and St. George's and St. Andrew's charitable societies. Most of these societies are in the city of Philadelphia.

Under the head of colleges, &c. we may enumerate the University of Pennsylvania, founded and endowed by the legislature during the late war, and lately united with the college of Philadelphia; Dickinson college, at Carlisle; Franklin college, at Lancaster; and the college at Washington (see COLLEGE); the academy of the Episcopalians, at York-town; the academies at German-town, Pittsburgh, Allen's-town, and other places; the schools of the Moravians, and other private schools in different parts of the state. The principal cities and towns of Pennsylvania are Philadelphia, the metropolis, the borough of Lancaster, Pittsburgh, Bethlehem, Nazareth, Carlisle, Harrisburg, Yorktown, Washington, Sunbury, &c. See the Table at the beginning of this article, and an account of each town under its respective name.

As to the constitution of this state, we may observe, that the supreme executive power of the commonwealth is vested in a governor; the legislative, in a general assembly, consisting of a senate and a house of representatives. The governor is chosen for three years, but cannot hold his office more than nine years in twelve. A plurality of votes makes a choice. The representatives are elected for one year; the senators for four. The latter are divided into four classes. The time of one class expires each year, whose seats are then filled by new elections. Each county chooses its representatives separately. The senators are chosen in districts formed by the legislature. There is to be an enumeration of the inhabitants once in seven years. The number of senators and representatives is, after each enumeration, to be fixed by the legislature, and apportioned among the several counties and districts, according to the number of taxable inhabitants. There can never be fewer than sixty, nor more than one hundred representatives. The number of senators cannot be less than one-fourth, nor greater than

one-third of the representatives. The elections are made on the second Tuesday of October. The general assembly meets on the first Tuesday of December, in each year, unless sooner convened by the governor. A majority of each house makes a quorum to do business, and a less number may adjourn from day to day and compel the attendance of members. Each house chooses its speaker and other officers, judges of the qualifications of its members, and establishes the rules of its proceedings. Impeachments are made by the house of representatives, and tried by the senate. All bills for raising revenue originate in the lower house, but the senate may propose amendments. The senators and representatives are free from arrests, while attending the public business, except in cases of treason, felony, and breach of the peace; and are not liable to be questioned concerning any thing said in public debate. They are compensated out of the public treasury, from which no money can be drawn but in consequence of appropriation by law. The journals of both houses are published weekly, and their doors kept open, unless the business require secrecy. All bills which have passed both houses, must be presented to the governor. If he approve he must sign them, but if he does not approve he must return them, within ten days, with his objections, to the house in which they originated. No bills so returned shall become a law, unless it be re-passed by two-thirds of both houses. The governor is commander-in-chief of the military force; may remit fines and forfeitures, and grant reprieves and pardons, except in cases of impeachment; may require information from all executive officers; may, on extraordinary occasion, convene the general assembly, and adjourn it, for any term not exceeding four months, in case the two branches cannot agree on the time themselves. He must inform the general assembly of the state of the commonwealth; recommend such measures as he shall judge expedient; and see that the laws are faithfully executed. In case of vacancy in the office of governor, the speaker of the senate exercises that office. The judicial power is vested in a supreme and inferior court, the judges of which, and justices of the peace, are appointed by the governor, and commissioned during good behaviour; but are removeable on the address of both houses. The other officers of the state are appointed, some by the governor, some by the general assembly, and some by the people. The qualifications for an elector are 21 years of age, two years' residence, and payment of taxes. They are privileged from arrests in civil actions, while attending elections. Those for a representative are 21 years of age, and three years inhabitancy. For a senator, 25 years of age, and four years inhabitancy. For a governor, 30 years of age, and seven years inhabitancy. The governor can hold no other office. The senators and representatives none, but of attorney at law, and in the militia. No person, holding an office of trust, or profit, under the United States, can hold any office in this state, to which a salary is by law annexed. All the officers of the state are liable to impeachment, and are bound by oath, or affirmation, to support the constitution, and perform the duties of their offices.

The declaration of rights asserts the natural freedom and equality of all; liberty of conscience; freedom of election, and of the press; subordination of the military to the civil powers; trial by jury; security from unreasonable searches and seizures; a right to an equal distribution of justice; to be heard in criminal prosecutions; to petition for the redress of grievances; to bear arms; and to emigrate from the state. It declares that all power is inherent in the people, and that they may, at any time, alter their form of government; that no person shall be obliged to maintain religious

worship, or support any ministry; that all persons, believing in the being of a God, and a future state of rewards and punishments, are eligible to office; that laws cannot be suspended but by the legislature; that all persons shall be bailable, unless for capital offences, when the proof is evident, or presumption strong; that every debtor shall be released from prison, on delivering his estate to his creditors, according to law, except there be strong presumption of fraud; that the privileges of the writ of *habeas corpus* shall not be suspended but in time of rebellion, or public danger; that no *ex post facto* law shall be made; that no person shall be attainted by the legislature, or forfeit his estate for a longer term than his own life; that no title of nobility, or hereditary distinction, shall ever be granted. The constitution above described was ratified in 1790.

Under the head of the history of this state it is not necessary to enlarge. Pennsylvania was granted by king Charles II. to Mr. William Penn, son of the famous admiral Penn, in consideration of his father's services to the crown (see his biographical article); and the charters received the royal signature on the 4th of March 1681. To secure his title against all claims, and prevent future altercation, Mr. Penn procured a quit-claim deed from the duke of York, of all the lands covered by his own patent, to which the duke could have the least pretensions. This deed bears date August 21, 1682. In the same month he obtained from the duke, by deed of feoffment, Newcastle, with 12 miles of the adjacent territory, and the land south to the Hoarkills. In December following, Mr. Penn effected an union of the lower counties with the province of Pennsylvania. The first frame of government for Pennsylvania is dated in 1682; another was proposed by Mr. Penn in 1683; in 1699, while Mr. Penn remained in Pennsylvania, the last charter of privilege, or frame of government, which continued till the revolution, was agreed upon and established. It was delivered to the people in October 1701. In 1700, 1701 and 1708, Mr. Penn obtained from different denominations of Indians some portion of territory. By the favourable terms which Mr. Penn offered to settlers, and an unlimited toleration of all religious denominations, the population of the province was extremely rapid. At the revolution the government was abolished; and the people, by their representatives, formed a new constitution on republican principles. The proprietaries were excluded from all share in the government, and the legislature offered them 130,000*l.* in lieu of all quit-rents, which was finally accepted. The proprietaries, however, still possess in Pennsylvania many large tracts of excellent land. After many disputes the republicans acquired the ascendancy, and the constitution underwent an alteration, that assimilated it nearly to the federal constitution. The federal constitution was ratified by Pennsylvania December 13, 1787. Morse's Geography, 1805.

PENNY, or PENY, in *Commercie*, an ancient English coin, which had formerly considerable course; but is now dwindled into an imaginary money, or money of account.

It is derived by Camden from *pecunia*; but others suppose that the word is formed from *pendo*, to weigh, and it was sometimes written, according to this origin, *penning*.

The ancient English penny, *penig*, or *pening*, was the first silver coin struck in England; nay, and the only one current among our Saxon ancestors; as is agreed by Camden, Spelman, Dr. Hickes, &c.

Of the heptarchic pennies we have given an account under the article MEDALS, &c., *Modern*; and we have there

given a brief history of the penny, as a silver coin, both before and after the Conquest.

The penny, which in Ethelred's time was the 20th part of the troy ounce, was equal in weight to our three-pence; five of them made one shilling, or scilling Saxon; and thirty a mark or mancuse, equal to our 7*s.* 6*d.* It was the largest silver coin in England, and retained this value till the reign of Edward III.

Till the time of king Edward I. the penny was struck with a cross so deeply indented in it, that it might be easily broke, and parted, on occasion, into two parts; thence called *half-pennies*; or into four, thence called *fourthings*, or *farthings*. But that prince coined it without indenture; in lieu of which he first struck round half-pence and farthings.

Stow, in his Annals, p. 200, observes, that half-pennies were first coined round, A. D. 1279, in the reign of Edward I. But historians have since discovered, that half-pennies of this kind were coined by Henry I., and that though the usual way in the reign of the two first Williams was to cut the penny into two for making of half-pennies, &c. yet it has been supposed that some few half-pennies might even then be coined round. Some few pieces of this kind are preserved in the cabinets of the curious. See Mr. Pegge's remarks on this subject in *Gent. Mag.* vol. xxviii. p. 64. &c.

Edward I. also reduced the weight of the penny to a standard; ordering that it should weigh thirty-two grains of wheat, taken out of the middle of the ear. (Stat. 13 Edw. I.) This penny was called the penny sterling. Twenty of these pence were to weigh an ounce; whence the penny became a weight, as well as a coin.

By 9 Edw. III. it was diminished to the twenty-sixth part of the troy ounce; by 2 Henry VI. it was the thirty-second part; by 5 Edw. IV. it became the fortieth, and also by 36 Hen. VIII. and afterwards the forty-fifth; but by 2 Eliz. sixty pence were coined out of the ounce, and during her reign sixty-two, which proportion is observed in our times.

The penny sterling is now disused as a coin; and scarcely subsists, but as a money of account, containing the twelfth part of a shilling, or the two hundred and fortieth part of a pound.

The course of exchange between England and France is settled on the foot of so many pence sterling, for a French crown of three livres. See EXCHANGE.

For an account of the French penny, or denier, in the old system, see DENIER. For the Dutch penny, see PENNING. For the German penny, see PFENING.

The *penny Flemish*, called "grote," or "groot," is a money of exchange in Flanders, Holland, and Hamburg. Accounts are sometimes kept in Brabant and Flanders in pounds Flemish of 20 shillings Flemish, subdivided into twelve groots or pence Flemish; but mostly in florins or gilders of 20 fluyvers or stivers, called also patacs, each of which was formerly subdivided into 16 pennings, but for a long time they have been divided into twelve parts or deniers. The pound Flemish, or pond Vlams, is reckoned at 2½ rix-dollars, 6 florins, 20 shillings, 120 stivers, 240 groots, or 1920 Brabant pennings. The rix-dollar, or patacon, is worth 2½ florins, 8 shillings Flemish, 48 stivers, or 96 pence Flemish. The Brabant penning contains three mites. See PFENING.

PENNY, in *Ancient Statutes*, &c. is used for all silver money.

And hence the *ward-penny*, *aver-penny*, *hundred penny*, *tithing-penny*, and *brothal-penny*. See PENCE, &c.

PENNY,

PENNY, in *Geography*, a town of Bengal; 18 miles S.E. of Purneah.

PENNY-Earth, in *Agriculture*, a term used by the farmers for a hard, loamy, or sandy earth, with a very large quantity of sea-shells intermixed in it, some of which being round and flat, and in some measure resembling pieces of money, have occasioned the earth's being called by this name. It is an earth not easily dug, but is usually undermined with pick-axes, and then falls in large lumps: which, with the frosts, break to pieces, and leave the shells loose. It is prepared by breaking and mixing well with water, and then makes very desirable floors. The Jersey combers' comb-pots are also made of it, and the sides and roofs of ovens are plastered with it; and being rightly managed, it combines into a floor almost as strong as plaster of Paris.

PENNY, *Bord*, *Half*. See *BORD Half-penny*.

PENNY, *Half*. See *HALF penny*.

PENNY, *Rete*. See *RETE-penny*.

PENNY, *Schar*. See *SCHAR-penny*.

PENNY, *Ward*. See *WARD-penny*.

PENNY or *Two-penny Post*. See *POST*.

PENNY-Royal, in *Botany*, &c. See *MENTHA Pulegium*.

PENNY-Royal, *Virginian*, a species of *Satureia*; which see.

PENNY-Weed, in *Agriculture*, a troublesome weed, known sometimes by the name of nettle.

PENNY-Wort, in *Botany*. See *COTYLEDON*.

PENNY-Wort, *Marj* and *Water*. See *HYDROCOTYLE*.

PENNY-Weight, a troy weight, containing twenty-four grains; each gram weighing a gram of wheat, gathered out of the middle of the ear, well dried.

The name took its rise hence, that this was actually the weight of one of our ancient silver pennies.

Twenty of these penny-weights make an ounce troy. See *WEIGHT*.

PENOBSCOT, in *Geography*, a river of America, which is the most considerable in the district of Maine, and rises by two branches in the high lands. Between the source of the W. fork, and its junction with the E., is Moosehead lake, 30 or 40 miles long, and 15 wide. The E. branch passes through several smaller lakes. From the Forks, as they are called, the Penobscot Indians pass to Canada, along either branch, principally the W., the source of which, as they say, is not more than 20 miles from the waters which empty into the St. Lawrence. At the Forks is a remarkable high mountain: and from thence down to Indian Old Town, situated on an island in this river, the distance is about 60 miles, and in the interval the river widens and embraces a great number of islands. Just below Indian town are the Great Falls, where is a carrying place of about 20 rods, and thence for 12 miles to the head of the tide there are no falls to obstruct boats. From thence for 35 miles to the head of Penobscot bay, or to the site of old fort Pownal, the river flows in a pretty straight course, and is easily navigated. Passing by Mahagaduse on the E. seven miles, and Owl's head twenty miles farther, you enter the ocean. The Indians have a communication from this river to Scoodick river, by a portage of three miles. This river was the eastern limit of Nova Scotia or Acadia, by the treaty of Utrecht. Within about twenty miles there are more than sixty islands, of various sizes, comprehending in the whole about 12,000 acres. Fifty-four of these the Indians have reserved to their own use.

PENOBSCOT, a bay on the coast of Hancock county, in the state of Maine, and called by the first discoverer "Norembege," about sixteen leagues wide from Naskeag point and Burnt-coat island on the E., to the point on which

Thomastown stands, on the W. side of the bay. The chief islands it incloses are Fox, Haut, Long and Deer islands; besides a number of small isles, rocks, and ledges. On a fine peninsula on the E. side of the bay, the British built a fort, and made a settlement, which is now the fire-town of the county of Hancock, and is a commodious place for the lumber trade. Haut island, or the isle of Holt, lies in N. lat. $44^{\circ} 23'$, and W. long. $68^{\circ} 10'$, and is the southernmost of the large isles.

PENOBSCOT, a post-town of Maine, on the E. side of the bay of its name, which is a port of entry, and carries on a small trade in fish and lumber. In 1796 it was divided into two towns; the one retaining the name of Penobscot, containing 935 inhabitants, and the other named "Castine," which see.

PENOBSCOTS, a small tribe of Indians who live in Indian Old Town, on an island in Penobscot river, and who say, that they have for five hundred years possessed the island on which their town stands. (See *INDIAN Old Town*.) In a former war, this tribe lost its lands; but at the commencement of the last war, some new restrictions were settled, and they consider that, notwithstanding these, they have a right to haul and fish as far as the mouth of the bay of Penobscot extends. This was their original right, in opposition to any other tribe, and they now enjoy it.

PENOMAZIN, a town of Siam; 60 miles S. of Tennasserim.

PENON. See *PENNON*.

PENON, *El*, in *Geography*, a town of South America, in the province of Carthagea; 36 miles S. of Mompox.

PENOWAL, a town of Hindoostan, in the circar of Oudeypour; 20 miles S.E. of Cheitor.

PENRHYN, a sea-port of North Wales, in the county of Caernarvon, on the Menai, from which great quantities of slate are exported; two miles S.W. of Bangor.

PENRHYN Dwa, a cape on the W. coast of Wales, and county of Caernarvon; 10 miles S. of Pwllhely.

PENRHYS, or *PENRICE*. See *OXWICH*.

PENRISE, a town of South Wales, in the county of Glamorgan, on the W. side of a bay in the Bristol channel, having a castle and a weekly market on Thursday; 14 miles W.N.W. of Swansea. N. lat. $51^{\circ} 46'$. W. long. $4^{\circ} 10'$. See *OXWICH*.

PENRITH, *NEW*, a market town in Leath ward, and county of Cumberland, England, is situated in a vale within the district called Inglewood Forest, 18 miles from Carlisle, and 283 from London. It is a place of considerable antiquity, and was successively in possession of the English and Scottish sovereigns; during whose contentions it suffered by the depredations of the Scots, by whom it was burned in the 18th of Edward III., and again in the following reign. About that period the plague raged in Penrith: and in the year 1597, a second visitation of this dreadful disorder nearly depopulated the parish; for 2260 persons fell victims to it within a year and a half. The fear of infection prevented the continuance of the regular markets; and places were appointed, without the town, for purchasing the provisions brought by the country people. Penrith is built in a very irregular manner: the houses are, in general, composed of red stone, and covered with blue slate. The population, in the year 1811, amounted to 4328, occupying 938 houses. The inhabitants are chiefly employed in agriculture, and in weaving checks and fancy cloths for waistcoats. A weekly market is kept on Tuesday, and here are five annual fairs. The stations for marketable commodities are disposed in a singular manner: the wheat market is in one part of the town, barley is sold

in

in another part, rye and potatoes in a third: cattle, hogs, and horses, have also distinct places of sale. The church is a neat, but plain structure: the body was rebuilt of red stone in the year 1722, at the expence of 2253*l.* and connected with the ancient tower. In the church-yard is a singular monument of antiquity, called the Giant's Grave, the origin of which has frequently exercised the sagacity and speculations of antiquarians. It consists of two stone pillars, standing at the opposite ends of a grave, about the distance of fifteen feet asunder, eleven feet six inches in height, and nearly five feet in circumference at the bottom, where they are mortised into round stones embedded in the earth. The space between them is two feet in breadth, and is inclosed by four thin semi-circular stones, two on each side, of unequal lengths, but little more than twenty inches in height. Three of these stones have an ornament of foliage, rudely sculptured, remaining round their upper edges; the fourth is plain, of a different kind, and seems to have been placed in the room of one decayed. The pillars taper upwards; their lower parts are rounded to about the height of seven feet, where they assume a square form, and appear to have terminated in a point; but the tops are broken. On the square parts are some traces of ornamental fret-work; and the interior side of one pillar has a rude delineation of some animal, resembling the wolf. Near the summit of each pillar are the vestiges of a raised cross, now almost obliterated. Bishop Lyttleton, in his remarks on this monument (published in the *Archæologia*;) inclines to the opinion of its being the sepulchre of some British prince interred here subsequent to the introduction of Christianity; and tradition ascribes it to the British king Ewain, a warrior of gigantic size, who reigned in this county in the time of Athelstan, or Ida. That this Ewain was actually buried at Penrith, appears in the highest degree probable, from the notice of his sepulchre in the "Verses of the Graves of the British Warriors," written about the close of the sixth century. At a small distance from this monument, with which, however, it does not appear to have any connection, is a single stone, called the Giant's Thumb, five feet eight inches in height, about fourteen inches broad at the lower part, but contracting upwards to ten inches: the head, which appears to have been circular, expands to the diameter of about eighteen inches. This seems to have been an ancient stone cross.

Previous to the year 1400, the inhabitants of Penrith were frequently distressed for fresh water: but about that time, Strickland, bishop of Carlisle, purchased a sufficiency of the water of the river Peteril, which he conveyed to the town at his own expence. He also founded a chantry here, and endowed it with six pounds annually for the support of a priest. The revenues of this establishment were given by queen Elizabeth to an ancient school (instituted so early as the year 1340,) which she refounded, by the title of "The Free Grammar School of Queen Elizabeth in Penrith."

Westward of this town are the ruins of a castle, which appears to have been built of an oblong form, and fortified with a very deep outward foss, and a walled rampart. This fortress was dismantled in the time of the commonwealth: the principal remains are the outside walls and arched vaults.

On the heights, to the north of Penrith, is a square stone building, called the Beacon, difficult of access, but affording a variety of delightful views of the surrounding country. *History and Antiquities of Westmoreland and Cumberland*, by Nicholson and Burn, 2 vols. 4to. 1777. *Beauties of England and Wales*, vol. iii. by Britton and Brayley.

PENRY, AR-HENRY, JOHN. in *Biography*, a victim to persecution and tyranny in the reign of queen Elizabeth, was born in some part of the county of Brecknock in the year 1559. When he was about the age of nineteen, he became a sub-sizer of Peter-House, in the university of Cambridge, where he was admitted to the degree of B.A. about the year 1583. After he had finished his college studies he took holy orders, and preached several times at Oxford, as he did afterwards at Cambridge, with much reputation, but he soon rendered himself obnoxious to the ruling party in the church, by adopting the sentiments of that body of the clergy who were distinguished by the name of *Puritans*. Having chosen his lot with this proscribed party, he travelled into Wales, and he is said to have been the first who preached the gospel publicly in Welsh, and sowed the good seed among his countrymen. In the year 1588 he published "A View of some Part of such Public Wants and Disorders as are in the Service of God, within her Majesty's Country of Wales, with an humble Petition for speedy Redress;" in which he undertook to shew, not only the necessity of reforming the state of religion among the Welsh, but also the most proper means of bringing about that work. He likewise published, about the same time, "An Exhortation to the Governors and People of her Majesty's Country of Wales, to labour earnestly to have the preaching of the Gospel planted among them." Both these pieces were written upon Puritanical principles, and were attacked by some zealous friends to the established hierarchy.

As the public printing-presses were shut against the Puritans, some of them purchased a private one, and carried it about from one part of the country to another to prevent discovery. The publications which excited the greatest attention, were supposed to be the productions of a club of writers, of whom Mr. Penry was esteemed one of the most active. Among the tracts which were printed and dispersed by them all over the kingdom, one that gave the most offence bore the title of "Martin Mar-Prelate," which contained a violent and bitter satire against the hierarchy, and all its supporters, and was soon followed by other pieces of the same description. When these pieces were known, a special warrant was issued by the privy-council in 1590, with the signatures of archbishop Whitgift and other members, for the apprehension of Mr. Penry as an enemy of the state, and calling upon all the queen's good subjects to consider him in that light. Penry withdrew into Scotland, where he drew up many observations on subjects relating to religion for his own private use; and he prepared the heads of a petition to the queen, intended to lay before her the true state of religion, and the many abuses in the church of England, especially in the management of ecclesiastical matters, of which her majesty was ignorant. One object of it was that he might be allowed to return to Wales, to preach the gospel in his native country. With the intention of finishing the petition above-mentioned, when opportunity should offer, and of delivering it afterwards to the queen with his own hands, Mr. Penry ventured back to England in the year 1593, and lived in concealment at Stepney, near London, till he was discovered, seized, and thrown into prison. Having obtained his papers, the privy-council determined to prosecute him without delay for a capital offence. No evidence could be brought against him but what his own private papers afforded; nevertheless, upon this, his enemies contrived to get a verdict against him, and it was soon resolved that he should be put to death. He protested against the sentence as totally contrary to the law of the land: he defied his persecutors to prove against him a single

a single act of disloyalty, but he had attacked the hierarchy, and could not be forgiven. Archbishop Whitgift was the first person who signed the warrant for his execution. As soon as the warrant was signed, it was sent to the sheriff, who, on the same day, gave orders to erect a gallows at St. Waterings, and while the prisoner was at dinner, sent his officers to bid him prepare to die that afternoon. He was accordingly carried, without delay, to the place of execution, and so savage was the conduct of the sheriff that he refused him the opportunity of addressing his friends, but was turned off in a hurry on the 29th of May 1593, when he was in the 34th year of his age. His learning and piety were highly extolled by his friends; and Mr. Strype says of him, "that he was well disposed to religion, but mistaken in his principles, and so very hot in his temper, and became so busy in church controversies, to his own destruction." He had connected himself with that branch of the Brownists, who maintained the discipline of the church of England to be popish and anti-christian, and all her ordinances and sacraments invalid. (See BROWNISTS.) Besides the articles already noticed, Mr. Penry was author of "An Appellation to the High Court of Parliament, from the bad and injurious Dealing of the Archbishop of Canterbury, &c.;" "A Dialogue on the injurious Dealings of the Bishops;" and "A Treatise to shew that Reformation, and those that sincerely favour the same, are unjustly charged to be Enemies to her Majesty and the State." The editor of this Cyclopædia traces his genealogy, by the maternal branch, to the family of Mr. Penry.

PENRYN, in *Geography*, a borough and market-town in the parish of St. Gluvias, hundred of Kerriar, and county of Cornwall, England, is situated three miles from Falmouth, and 266 from London, on the side of a hill, and bank of a river, called the King's road, which unites with Falmouth harbour. The town formerly possessed a college, which, according to Leland, was castellated, and had three strong towers. Parts of this were lately to be seen, but are now enveloped by modern buildings. The manor was an appendage to the see of Exeter, and the town appears to have been made a borough by one of the bishops towards the end of the reign of Edward I. The town was incorporated in the 18th year of James I. and is governed by a mayor, recorder, steward, portreeve, twelve aldermen, twelve common-council-men, a town clerk, and other officers. Two members are returned to parliament; the right of election is in the mayor, aldermen, and inhabitants paying scot and lot. Three weekly markets are held on Wednesday, Friday, and Saturday, and three fairs annually. The market-house, which is also used as a town-hall, stands near the middle of the principal street, from which others diverge at right angles. From the peculiar situation of the town, it possesses an extensive fishery. In the population returns of the year 1811, Penryn is stated to contain 362 houses, inhabited by 2713 persons. On the opposite side of the river is the village of St. Gluvias, the church and parsonage house of which are placed in very beautiful situations. Polwhele's History, &c. of Cornwall. Beauties of England and Wales, vol. ii.

PENS, a town of the island of Cuba; 22 miles S.W. of Bayamo.

PENSA LIBRA, in our *Ancient Customs*, a pound of money paid by weight, not by tale.

PENSACOLA, in *Geography*, the capital of West Florida, situated on the W. side of a bay, to which it gives name. The harbour is on the N. shore of the gulf of Mexico; 11 leagues E. of Port Lewis and Mobile, and 158 W. of the islands of Tortuga. It is spacious, and fe-

cure from all winds, and has four fathoms of water at its entrance, deepening gradually to seven or eight. The bay lies in N. lat. 30° 15', and W. long. 87° 14', and admits of vessels drawing no more than 21 feet of water. The town is of an oblong form, healthfully, as well as delightfully situated, about one mile in length, and a quarter of a mile in breadth. While the British nation possessed it, it contained several hundred habitations, and many of the houses and public buildings were spacious and elegant. But since the Spaniards took possession of it, it has been upon the decline. The exports from this town, consisting of skins, logwood, dyeing stuff, and silver dollars, amounted, while it belonged to Britain, to 63 000*l* annually; and the average value of imports from Great Britain was 97,000*l*. The town and fort of Pensacola surrendered, after a spirited defence, to the Spaniards in 1781; and with them the whole province. The entrance into the bay is defended by a small fort and the W. end of Rose's island, and a battery nearly opposite, on the main land. Escambia Coenecuh river is the largest stream which falls into the bay; it admits shallops some miles up, and boats upwards of 50 miles. N. lat. 30° 18'. W. long. 87° 17'.

PENSEN, a town of Germany, in the principality of Culmbach; six miles E. of Bayreuth.

PENSFORD *St. Thomas*, or as it is sometimes called *Publow St. Thomas*, a small market town in the hundred of Keynsham, and county of Somerset, England, is seated on the river Chew, which here flows through a fine wooded vale environed by small hills, the acclivities of which are covered with orchards. It is a town of high antiquity, and is conjectured by Dr. Stukeley to have derived its name from the British words *Pen Ifc*, signifying the head of the river, being near the source of the Chew. In the time of Leland it seems to have been a very flourishing place, for it is mentioned by that assiduous antiquary as "a praty townlet, occupied with clothinge." This business is now, however, much declined, and the town is nearly bereft of all its former trade. None of its buildings deserve notice except the church, which is a handsome, modern structure, with a tower at the west end, apparently of more ancient date than its other portions. The market day here is Tuesday, and there are two fairs annually. An old stone bridge of three arches is thrown over the river, and connects the town with the village of Publow, to the church of which that of Pensford is a chapelry, though in other respects it is parochial.

According to the late population returns, (1811,) Pensford town and parish contain 66 houses and 144 inhabitants. By the same census the parish of Publow contains 166 houses and 820 inhabitants. History of Somersetshire by the Rev. John Collinson, vol. ii. 4to. Beauties of England and Wales, vol. xiii.

PENSILES HORTI, in *Antiquity*, gardens raised on arches by Nebuchadnezzar, king of Babylon, in order to gratify his wife Amyctis, daughter of Altyages, king of Media. Q. Curtius makes them equal in height to the walls of the city, viz. fifty feet. They contained a square of four hundred feet on every side, and were carried up into the air in several terraces, laid above one another, and the ascent from terraces to terraces was by stairs ten feet wide. The arches sustaining the whole pile were raised above one another, and it was strengthened by a wall, surrounding it on every side, of twenty-two feet in thickness. The floors of each of the terraces were laid in the following manner: on the top of the arches were first laid large flat stones sixteen feet long and four broad, and over them was a layer of reed, mixed with a great quantity of bitumen, over which were two rows of bricks closely cemented together by plaster,

plaster, and over all were laid thick sheets of lead; and, lastly, upon the lead was laid the mould of the garden. The mould or earth was of such a depth, as to admit the largest trees to take root and grow; and it was covered with various kinds of trees, plants, and flowers. In the upper terraces there was an aqueduct or engine, whereby water was drawn up out of the river, for watering the whole garden. *Diod. Sic. lib. ii. Strab. lib. xvi. Q. Curtius, lib. v. c. 1. or Prid. Conn. vol. i. p. 144.*

PENSION, PENSIO, a yearly appointment, or sum of money paid any one for services or considerations already past. Of this kind are pensions from the crown, which disqualify those, on whom they are conferred, for being elected members of the house of commons. (See **PARLIAMENT**.) Those pensions exceeding the value of 100*l. per annum* are subject to a duty consisting in an annual payment of one penny in the pound, (over and above all other duties). A person, who takes a pension from any foreign prince without the consent of the king, is chargeable with the crime of contempt against the king's prerogative. See **CONTEMPT**.

For pensions of an ecclesiastical nature, see **CORODY** and the article **PENSIONS**.

PENSION, in *Military Language*, denotes the annual allowance granted by his majesty to the indigent widows of officers killed, or dying in the service, which may be considered as a kind of military reward. The fund for these pensions arises from the pay of two fictitious men, borne on the muster-roll of every troop or company in the army on the British establishment. The mode of granting this bounty is subject to certain regulations accompanying this grant in the year 1737. An augmentation has been since made to the amount of these pensions; and the new rates, commencing from the 25th of December, 1798, are as follow: for a colonel's widow, 80*l. per annum*; lieutenant colonel's, 50*l.*; major's, 40*l.*; captain and captain lieutenant's, 30*l.*; lieutenant's, 26*l.*; second lieutenant, cornet, ensign, quarter-master, and adjutant's, 20*l.*; pay-master's of the regiment or district, 26*l.*; chaplain's, 16*l.*; surgeon's of the regiment, 26*l.*; staff surgeon and apothecary's, 26*l.*; physician and purveyor's, 30*l.*; assistant and veterinary surgeon's, 20*l.*; deputy purveyor and hospital mate's, 16*l. per annum*. The pensions to widows of sea-officers, granted by the admiralty, are considerably increased, commencing from January 1814.

PENSION in the inns of court. That, which in the two Temples is called a *parliament*, and in Lincoln's Inn a *council*, is in Gray's Inn termed a *pension*; viz. an assembly of the members of the society to consult of the affairs of the house. *Pensions* also denote certain annual payments of each member to the house, for certain occasions.

When a pension writ is issued, none sued thereby in the inns of court shall be discharged, or permitted to come into commons, till all duties be paid.

Hence, a pension order, in the same inn, is a peremptory order against such of the society, as are in arrear for pensions, and other duties.

PENSIONS of Churches, are certain sums of money paid to clergymen in lieu of tithes; and some churches have settled on them annuities or pensions, payable by other churches; which pensions are due by virtue of some decree made by an ecclesiastical judge upon a controversy for tithes, by which the tithes have been decreed to be enjoyed by one, and a pension instead of them to be paid to another; or they have arisen by virtue of a deed made by the consent of the parson, patron, and ordinary; and if such pension hath been usually paid for twenty years, then it may be claimed by prescription, and be recovered in the spiritual court; or a

parson may prosecute his suit for a pension by prescription, either in that court, or at common law, by a writ of annuity; but if he takes his remedy at law, he shall never afterwards sue in the spiritual court. If the prescription be denied, that must be tried by the common law. *F.N.B. 51. Hard. 230. Ventr. 120.*

PENSIONARY, or PENSIONER, a person who has a pension, appointment, or yearly sum, payable during life, by way of acknowledgment: charged on the estate of a prince, company, particular person, or the like.

In the Romish countries it is frequent to have pensions on benefices; these were anciently granted with a great deal of ease, under pretence of infirmities, poverty, &c. But since the twelfth century, these pretences were carried so far, that the incumbents, or titularies, of benefices, were little more than farmers.

This obliged the spiritual powers to fix the causes, and the quantities, of pensions. Pensions are now only creatable by the pope, and are never to exceed one-third of the revenue; two-thirds being still to remain to the incumbent.

PENSIONARY was also the appellation of the first minister of the states of the province of Holland; under the old system.

The pensionary was chairman in assemblies of the states of that province; he proposed the matters to be consulted on, collected the votes, formed and pronounced the resolutions of the states; he also opened letters, conferred with foreign ministers, &c.

He was charged with inspecting the finances, preserving the rights of the province, maintaining the authority of the states, and seeing to the observation of the laws, &c. for the good of the state. He assisted in the college of deputy-counsellors of the province, who represented the sovereignty in the absence of the states; and he was perpetual deputy of the states-general of the United Provinces. His commission was only given for five years; after which it was deliberated whether or no it should be renewed. Indeed there was no instance of its having been revoked. Death only put a period to the functions of this important minister. Formerly he was called the *advocate of the province*: the title pensionary was only given at the time Barneveldt had the office. Grotius calls him in Latin *adversor jurisperitus*; Merula, *advocatus generalis*; and Matthæus, professor at Leyden, *filiarius pensionarius*, which is the quality the states gave him in their instruments.

PENSIONARY was also the first minister of the regency of each city, in the province of Holland.

His office was, to give his advice in matters relating to the government, either of the city in particular, or of the state in general; and in assemblies of the states of the province he was speaker in behalf of his city.

Yet the function of these pensionaries was not alike every where; in some cities they only gave their advice; and were never found in assemblies of the magistrates, except when expressly called thither; in others they attended constantly; and in others they even made the propositions on the part of the burgher-masters, drew up their conclusions, &c. They were called pensionaries, because they received an appointment or pension.

PENSIONERS, GENTLEMEN, a band of gentlemen, whose business it is to guard the king's person in his own house; and who for that end wait in the presence-chamber.

They were first set on foot by king Henry VII.; the number is forty; and each is obliged to keep three double horses, and a servant, who is to be armed; so that they properly

properly make a troop of guards, and have accordingly been mustered by their own officers; but this part of duty, to which they are sworn, the king usually dispenses with.

Their officers are a captain, whose salary is 100*l.* a-year, lieutenant, with 50*l.* a-year, standard-bearer, with 31*l.* a-year, and clerk of the cheque, whose annual appointment is 12*l.* Their ordinary arms are gilt pole-axes, with which they attend the king to and from the chapel royal; receiving him in the presence-chamber, or coming out of his private lodging; as also at all great solemnities. Their pension 100*l. per annum.*

To this band belong also a pay-master, harbinger, axe-keeper, and messenger.

PENSTOCK. See PEN.

PENTA, in *Geography*, a town of the island of Corsica; seven miles N.E. of La Porta.

PENTACEROS, in *Natural History*, a name given by Linkius, and some other authors, to a kind of *stella marina*, or sea star-fish, composed of five principal rays, with several transverse hairy or downy processes.

PENTACHONDRA, in *Botany*, from *πεντε*, *five*, and *χονδρος*, *a grain*, because of the five seeds in the berry, by which character the genus is distinguished from its allies. Brown Prodr. Nov. Holl. v. 1. 549. Class and order, *Pentandria Monogynia*. Nat. Ord. *Epacrideæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, double; the innermost of five equal, lanceolate, concave leaves; outermost of four or more, much smaller, imbricated ones. *Cor.* of one petal, funnel-shaped; limb in five spreading equal segments, longitudinally bearded on the upper side with dense hairs. Nectary of five scales, at the base of the germen. *Stam.* Filaments five, thread-shaped, equal, inserted into the tube; anthers incumbent, oblong. *Pist.* Germen superior, roundish, of five cells; style short, columnar; stigma obtuse. *Peric.* Berry with five seeds.

Ess. Ch. Outer calyx of four or more leaves. Corolla funnel-shaped; its limb spreading, longitudinally bearded. Berry with five seeds.

Obs. This genus might perhaps, without impropriety, be referred to *LEUCOPOGON*, see that article; it being very difficult in this tribe to define the limits between a drupa and a berry, at least in some cases.—The species are dwarf mountain shrubs, with scattered stalked leaves, and solitary, terminal, erect, white flowers.—They are natives of Van Diemen's land and New Zealand.

1. *P. involucrata*.—Filaments projecting beyond the tube. Calyx fringed; the outer one of eight scales. Leaves elliptic-lanceolate, flattish, many-ribbed. Young branches downy. Stem erect.—Gathered by Mr. Brown, in Van Diemen's land.

2. *P. pumila*. (*Epacris pumila*; Forst. Gen. t. 10. f. a—b. Prodr. 13.)—Stamens shorter than the tube. Outer calyx of four scales. Leaves nearly elliptical, three-ribbed, naked at the margin. Young branches smooth. Stem prostrate, much branched.—Found by Forster in New Zealand; by Mr. Brown in Van Diemen's land.

PENTACHORD, in *Ancient Music*, an instrument of five strings invented by the Scythians, played with the jaw-bone of a dog, instead of a plectrum. Laborde. The concord of the fifth is sometimes called pentachord.

PENTACROSTIC, a set or series of verses, so disposed as that there are always found five acrostics of the same name, in five divisions of each verse. See *ACROSTIC*.

PENTACTINODOS, in *Natural History*, a name given by some authors to those species of star-fish which are composed of a body divided into five rays.

PENTADACTYLON, *Five-Fingers*, in *Botany*, a name

given by some authors to the ricinus, or palma Christi, from the figure of its leaf.

PENTADACTYLOS PISCIS, the *Five-fingered Fish*, in *Ichthyology*, the name of a fish common in all the seas about the East Indies, and called by the Dutch there *wijfinger visch*.

It has this name from five black streaks which it has on each side, resembling the prints of five fingers. It grows to about a foot and half long; its head is small in proportion to its body; its snout is long, and its fins large, and reaching almost to its tail; its general colour is very bright and elegant, a yellow, with an admixture of purple, and of a silvery gloss; it has no scales, and is a dry but not ill-tasted fish.

PENTADACTYLOS-ASTER, in *Natural History*, a name given by Linkius, and some other authors, to a species of star-fish, composed of a small body, and five principal rays, which have each several processes coming from them, covered with down.

PENTAEDROSTYLA, the name of a genus of spars. The word is derived from the Greek *πεντε*, *five*, *ηδρον*, *sides*, and *στυλος*, *a column*.

The body of the genus are spars, in form of pentangular columns, terminated by pentangular pyramids at one end, and irregularly fixed at the other to some solid body.

Of this genus there are three known species.

PENTAGLOSSUM, in *Botany*, from *πεντε*, *five*, and *γλωσσα*, *the tongue*, in allusion probably to the shape of the five red petals, is a genus founded by Forskall, Fl. Ægypt. Arab. 11, upon the *Lythrum thymifolium* of Linnæus, which having but two stamens, was not recognized by its finder, as a *Lythrum*, though its whole habit, and every character besides, precisely accord with that well-known genus. See *LYTHRUM*.

PENTAGON, from *πενταγωνος*, *quinguanulus*, compounded of *πεντε*, *five*, and *γωνια*, *angle*, in *Geometry*, a figure of five sides and five angles.

If the five sides are equal, the angles are so too; and the figure is called a *regular pentagon*, as *Plate X. Geometry, fig. 17*. Most citadels are regular pentagons.

The most considerable property of a pentagon is, that one of its sides, *v. gr.* DE, is equal in power to the sides of a hexagon and a decagon inscribed in the same circle ABCDE; that is, the square of the side DE is equal to the sum of the squares of the sides Da and Db.

A pentagon, and also a decagon, may be inscribed in a circle, by drawing the two diameters AP, mn (*fig. 18.*) perpendicular to each other, and bisecting the radius on at q. With the centre q, and distance qA, describe the arc Ar, and with the centre A, and radius Ar, describe the arc rB. Then AB is one-fifth of the circumference, and AB carried five times over will form the pentagon; and the arc AB bisected in s will give As the 10th part of the circumference, or the side of the decagon. See *DECAGON*.

If tangents be drawn through the angular points, they will form the circumscribing pentagon or decagon. See *POLYGON*, and *REGULAR Figure*.

Pappus has also demonstrated, that twelve regular pentagons contain more than twenty triangles inscribed in the same circle, lib. v. probl. 45.

The dodecahedron, which is the fourth regular body, consists of twelve pentagons.

PENTAGON-ASTER, in *Natural History*, a name given by Linkius, and other authors, to a kind of *stella marina*, or star-fish, composed of five rays, with a number of transverse

transverse processes issuing from them, covered with a hairiness.

It is one of the general classes of the *stella crinitæ*, so called from this hairiness.

PENTAGONIA, in *Botany*, from *πεντε*, *five*, and *γωνια*, *an angle*, because of the figure of the corolla, a name given by some old writers to those species of *Campanula* that have a wheel-shaped corolla, with five angles, of which *C. Speculum*, or *Venus's looking-glass*, is an example. L'Heritier once intended to form a separate genus of these plants, by the name of *Prisnatocarpus*; but on due consideration of the great diversity of figure, in the corolla, of other species of the very natural genus *Campanula*, he gave up his design.

PENTAGONOTHECA, from *πεντε*, *five*, *γωνια*, *an angle*, and *κερα*, *a case or cell*, a name given by Vaillant to the *PEISONIA*, (see that article,) on account of the form of its feed-vessel.

PENTAGRAPH, an instrument whereby designs, prints, &c. of any kind, may be copied in any proportion, without a person's being skilled in drawing.

The instrument is otherwise called a *parallelogram*.

The common pentagraph (represented *Plate XXIII. Miscel. fig. 5.*) consists of four brass or wooden rulers, two of them from fifteen to eighteen inches long, the other two half that length. At the ends, and in the middle of the longer rulers, as also at the ends of the shorter, are holes, upon the exact fixing of which the perfection of the instrument chiefly depends. Those in the middle of the long rulers are to be at the same distance from those at the end of the long ones, and those of the short ones; so that, when put together, they may always make a parallelogram.

The instrument is fitted together for use by several little pieces, particularly a little pillar, N^o 1, having at one end a screw and a nut, whereby the two long rulers are joined; and at the other a little knot for the instrument to slide on. The piece, N^o 2, is a rivet with a screw and nut, with which each short ruler is fastened to the middle of each long one. The piece, N^o 3, is a pillar, one end of which, being hollowed into a screw, has a nut fitted to it. At the other end is a worm to screw into the table; when the instrument is to be used, it joins the ends of the two short rulers. The piece, N^o 4, is a pen, porcupine, or pencil, screwed into a little pillar. Lastly, the piece, N^o 5, is a brass point, moderately blunt, screwed likewise into a little pillar.

Use of the Pentagraph, or Parallelogram.—1. To copy a design in the same scale or bigness as the original; screw the worm, N^o 3, into the table: lay a paper under the pencil, N^o 4, and the design under the point, N^o 5. This done, conducting the point over the several lines and parts of the design, the pencil will draw or repeat the same on the paper.

2. If the design be to be reduced, *e. gr.* into half the pace, the worm must be placed at the end of the long ruler, N^o 3, and the paper and pencil in the middle. In this situation conduct the brass point over the several lines of the design, as before; and the pencil at the same time will draw its copy in the proportion required; the pencil here only moving half the lengths that the point moves.

Hence, on the contrary, if the design be to be enlarged by one half, the brass point, with the design, must be placed in the middle at N^o 3, the pencil and paper at the end of the long ruler, and the worm at the other.

3. To enlarge or reduce in other proportions, there are holes drilled at equal distances on each ruler: *viz.* all along the short ones, and half way of the long ones, in order for placing the brass point, pencil, and worm, in a right line therein; *i. e.* if the piece carrying the point be put in the

third hole, the two other pieces must be put in its third hole.

If, then, the point and design be placed at any hole of the great rulers, and the pencil with the paper at any hole of the short ruler, which forms the angle therewith, the copy will be less than half the original. On the contrary, if it be placed at one of the holes of that short ruler, which is parallel to the long ruler, the copy will be greater than half the original.

The construction of this instrument requires a very considerable degree of accuracy; for which reason there are very few of the instruments that succeed. Few will do any thing tolerably but straight lines; and many of them not even those. In order to prove that the figure described by a pentagraph is similar to the given figure; let C, (*fig. 6.*) be the fixed centre of motion; P the pencil for tracing the given figure PP, and p the pencil which traces the other figure pp; p, &c. must be so adjusted, that p, C, and P, may lie in one straight line; then, since Bp : Ap :: BP : AC, whatever be the situation of the pentagraph, the angles PCP and pCp, are vertical; and, therefore, PCp will in every position of the instrument be a right line; but PC : pC :: BA : Ap, in each of the two positions in the figure, and consequently the triangles PCP, pCp, are similar; and PP : pp (:: PC : C p) :: BA : Ap, or in a given ratio. Hence it appears, that by moving the pencil p, Ap may be equal to BA, or less in any proportion; and consequently pp may be equal to PP, or less in the same proportion.

PENTAGYNIA, in *Botany, from *πεντε*, and *γυνη*, *a female*, the name of an order which occurs in the 5th, 10th, 11th, 12th, and 13th classes of the Linnæan artificial system. Its character depends, as the name expresses, on the presence of five styles, or, if styles be wanting, of so many sessile stigmas. In the 12th class however, *Icofandria*, it is necessary to take this character with considerable latitude. Plants of the natural tribe of *pomaceæ*, which make an important part of that class, are very uncertain as to the number of their styles in the same genus, and even variable in the same species. Hence the writer of the present article has, in his Introduction to Botany, chap. 24, presumed to advise that the order in question should admit flowers with from two to five styles, or even a few more occasionally. In the 13th class, *Polyandria*, the order *Pentagynia* separates some genera, from others, to which they are closely allied, in the *Trigynia*, and admits *Nigella*, some species of which have ten styles. Hence it is no less eligible to adopt the same latitude here as in *Icofandria*. Perhaps the definition of the order, in both these classes, might most conveniently be "*styles from two to ten.*"*

Some genera in other classes may have five styles; but the orders of such classes being marked by other characters, the number of styles usually becomes a part of the generic definition.

PENTALOBA, so named by Loureiro, from the five lobes of the berry. Loureir. Cochinch. 154.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Meliæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of five lanceolate, erect, hairy leaves. *Cor.* Petals five, lanceolate, erect, cohering by their lower part, somewhat reflexed at their summits. Nectary tubular, erect, with five teeth. *Stam.* Filaments five, thread-shaped, flattish, inserted into the incisions of the nectary, about as long as the petals; anthers ovate, erect. *Pistl.* Germen roundish, hairy, with five furrows; style short, thick, hairy; stigma simple. *Peric.* Berry roundish, five-lobed, of one cell. *Seeds* five, ovate.

Ess. Ch. Corolla of five petals, bell-shaped. Nectary tubular,

tubular, five-cleft, bearing the stamens. Calyx of five leaves. Berry superior, with five lobes, and five seeds.

1. *P. fessilis*.—Native of hills in Cochinchina, where it is known by the name of Cáy Cuong tau, and forms a middle-sized tree, with ascending branches. Leaves alternate, lanceolate, slightly serrated, smooth. Flowers sessile, clustered together, of a pale hue.—We have seen no specimen, but we do not recognize any known plant in the above characters and description.

PENTALUPO, in *Geography*, a town of Naples, in Calabria Ultra; 6 miles E. of Reggio.

PENTAMETER, derived from πενταμετρος, *q. d.* five measures, in *Poetry*, a kind of verse, consisting of five feet or metres.

The two first feet of a pentameter may be either dactyls or spondees; the third must be always a spondee; and the two last anapaests.

It is usually joined to hexameters, in elegies, epistles, epigrams, and other little pieces. There is no work extant of pentameters alone.

PENTANDRIA, in *Botany*, the fifth class in the Linnæan artificial system, is so called from its distinctive character of having five unconnected stamens, in the same flower with the pistil or pistils. This is the largest of all the Linnæan classes. The number five prevails far beyond any other in the structure of flowers; for the great class *Syngenesia* has also five stamens in nearly every known instance, but their anthers are united into a tube, and the flowers compound. Some genera of the *Pentandria* indeed have likewise combined anthers, and such, having simple flowers, constitute the Linnæan order of *Syngenesia Monogamia*; an order now, by common consent, abolished, being found not only unnatural, but highly inconvenient, various species of other genera, as *Gentiana*, having likewise combined anthers.

The orders of the 5th class are six. 1. *Monogynia*, one of the largest and most important in the whole system, comprehending several natural tribes or orders, as the *Asperifoliae*, to which Borage and Viper's Bugloss belong, strongly evincing their claim to the last-mentioned appellation; the elegant *Precie*, of which the Primrose is an example; the *Rotaceae*, to which the beautiful *Hottonia* belongs; the *Lurida* or Nightshade tribe, the *Campanulaceae*, the *Vites*, amongst various other things, follow, and the order closes with a part of the *Contortae*. 2. *Digynia*, begins with the remainder of the *Contortae*, followed by some genera with incomplete flowers, as *Chenopodium*, *Salsola*, *Ulmus*; to which succeed *Swertia*, *Gentiana*; and others. The rest of the order is made up of the *Umbelliferae*, an extensive, peculiar, and difficult tribe, of which we shall speak in its proper place hereafter. 3. *Trigynia*, has the Sumach, Elder, and *Viburnum*, with *Passiflora*, and various other plants; but this order is much smaller than either of the preceding. 4. *Tetragynia*, consists merely of *Evolvulus* and *Parnassia*. 5. *Pentagynia* has, from the agreement between the number of styles and of stamens, a considerable proportion of plants, among which are *Statice*, *Linum*, *Drosera*, *Crassula*, all large genera, with a few smaller ones. 6. *Polygynia* consists of *Myosurus* and *Xanthorrhiza*.

Willdenow has made an order, *Pentandria Decagynia*, for the admission of Forster's *Schefflera*, which has ten styles; but he properly records an observation of the late Mr. Dryander, that this genus is an *Aralia*.

PENTANDRIA is also the appellation of some orders in the Linnæan system, as the second of the class *Monadelphia*, comprehending *Erodium*, *Hermannia*, &c.: the 1st in *Dia- delphia*, consisting of *Monneria* only; the 5th in *Gynandria*,

according to Linnæus, but we scarcely know a genuine example; and finally the 5th orders in *Monocia* and *Dioecia*.

PENTANGLE, in *Geometry*, a figure with five angles.

PENTAPETALOUS PLANTS, are such whose flowers consist of five leaves.

PENTAPETES, in *Botany*, πενταπέτης, having five leaves, an ancient name for Cimquefoil, adopted for a very different plant by Linnæus. Though he declines any explanation of it, the five leafy expansions, which, in his *Pentapetes*, accompany the stamens, seem so well to account for this appellation, that one cannot but think the idea of such an adaptation of the word had occurred to him, though he might have forgotten it when he wrote the *Philosophia Botanica*, p. 175. There seems otherwise no possibility of accounting for his choice of the name, for the particular genus in question; of which indeed what is now separated under the denomination of *PTEROSPERMUM*, see that article, was the original type, but the above character is common to that and the present genus.—Linn. Gen. 351. Schreb. 459. Willd. Sp. Pl. v. 3. 727. Mart. Mill. Dict. v. 3. Juss. 276. Lamarek Illustr. t. 576. Gærtn. t. 134.—Class and order, *Monadelphia Dodecandria*. Nat. Ord. *Columniferae*, Linn. *Malvaceae*, Juss.

Gen. Ch. Cal. Perianth inferior, double; the outer a little remote, of three lanceolate, pointed, deciduous leaves; inner of one leaf, in five deep, lanceolate, pointed, spreading segments, permanent. Cor. Petals five, roundish, spreading, oblique, affixed by their claws to the tube of the stamens. Stam. Filaments 15, thread-shaped, erect, shorter than the corolla, united below into an oblong pentagonal tube, but separate above; anthers arrow-shaped, erect. Between every parcel of three stamens stands a linear-lanceolate, obtuse, erect, petal-like leaf, originating from the tube, and much longer than the stamens, being five in all. Pist. Germen superior, ovate, with five furrows; style thread-shaped, rather longer than the five leaf-like appendages, swelling upwards, striated; stigma with five slight segments. Peric. Capsule membranous, nearly globose, pointed, of five cells and five valves, the partitions from the centre of each valve. Seeds eight in each cell, inserted in two rows into the central column, obovate, angular, abrupt, without wings.

Ess. Ch. Calyx double; the outer of three leaves, deciduous. Petals five. Stamens fifteen, with five intermediate leafy appendages. Stigma club-shaped. Capsule membranous, of five cells, with contrary partitions. Seeds numerous.

1. *P. phanicea*. Scarlet Pentapetes. Linn. Sp. Pl. 958. Ait. Hort. Kew. ed. 1. v. 2. 438. I. Mill. Illustr. t. 58. Mill. Ic. t. 200. (*Dombeya phænicea*; Cavan. Diff. 129. t. 43. f. 1. *Blattaria ceylanica*, flore amplo coccineo; Comm. Hort. v. 1. 11. t. 6. Flos impius; Rumph. Amboin. v. 5. 288. t. 100. f. 1.)—Native of various parts of the East Indies, sometimes cultivated for its beauty in our stoves, where it has been known considerably above a century. It flowers in July, and is annual. The stem is two or three feet high, round, branched, leafy, besprinkled with a few close-pressed starry bristles, indicative of its natural order. Leaves alternate, stalked, lanceolate, taper-pointed, strongly crenate, smoothish, more or less hastate at the base. Stipulas in pairs, linear. Flowers axillary, solitary, drooping, on rough stalks shorter than the footstalks; they are of a beautiful scarlet colour, and above an inch in diameter; the five leafy appendages are externally rough or hoary. The foolish name by which Rumphius has distinguished this flower, and which is said to be a translation of its Indian appellation, alludes to its "profane or impious nature, in never looking towards heaven." So may flowers, as well

as men, be sometimes calumniated! The all-wise Creator, rich in infinite resources, has caused this and many more blossoms to droop, that their stamens may be sheltered from rain; whilst the same end is accomplished in others by their courting the full blaze of day, in an erect expanded position. In the spring of our damp climate, drooping or closed flowers abound; in India perhaps a different economy is generally best suited to the nature of the country. S.

PENTAPETES, in *Gardening*, comprises a plant of the exotic kind, for the stove, of which the species cultivated is the scarlet-flowered pentapetes (*P. phœnicea*).

Method of Culture.—This plant may be increased by sowing the seeds upon a good hot-bed early in March; and when the plants are fit to remove, there should be a new hot-bed prepared to receive them, into which must be plunged some small pots filled with good kitchen garden earth; into each of which one plant should be put, giving them a little water to settle the earth to their roots, shading them from the sun till they have taken new root; when they should be treated in the same way as other tender exotic plants, admitting the free air to them every day in proportion to the warmth of the season, and covering the glasses with mats every evening. When the plants are advanced in their growth, so as to fill the pots with their roots, they should be shifted into larger pots, filled with the same sort of earth as before, and plunged into another hot-bed, where they may remain as long as they can stand under the glasses of the bed without being injured; and afterwards they must be removed either into a stove or glass-case, where they may be screened from the cold, and in warm weather have plenty of fresh air admitted to them.

These plants are sometimes turned out of the pots when they are strong, and planted in warm borders; where, if the season prove very warm, the plants will flower tolerably.

PENTAPHARMACUM, a medicine consisting of five ingredients: it has also been applied in the same sense to ailments. Adrian the emperor was, as we are informed, particularly fond of a dish of five ingredients, called by this name. The ingredients were the udder of a sow, ham, peacock, brawn, and a sort of paste.

PENTAPHYLLOIDES, in *Botany*. See POTENTILLA and PENTAPHYLLUM.

PENTAPHYLLUM, an old name, synonymous with *Quinquifolium*, and applied, like that, by some of the old writers to such species of *Potentilla* as have five, or sometimes more, radiating leaflets upon one stalk, forming a digitate leaf. Those species that are furnished with leaves otherwise constructed, make Tournefort's genus of *Pentaphylloides*.

PENTAPLEURUM, a name given by some botanical writers to the common small plantain, usually called *ribwort* and *plantago quinquerivola*, from its leaves always having just five ribs running along them.

PENTAPOGON, from *πεντε*, five, and *πωγων*, a beard, was so named by M. R. Brown, in allusion to the five beards, or awns, of the husk.—Brown *Prædr. Nov. Holl. v. 1. 173.*—Class and order, *Triandria Dignia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume of two oblong, acute, equal, beardless valves, containing one stalked floret. *Cor.* of two valves; the outermost rather longer than the calyx, ovate, bearing five awns at the summit, of which the middle one is much the longest, and spirally twisted; inner half the size of the outer, ovate, acute, concave, membranous, beardless. *Stam.* Filaments three, capillary, shorter than the corolla; anthers oblong, pendulous. *Pist.* Germen superior, roundish; styles none; stigmas two, spreading, feathery. *Peric.* none, except the permarct corolla. *Seed* one, oblong, pointed.

Eff. Ch. Calyx of two equal, beardless valves, containing

one stalked floret. Outer valve of the corolla with five terminal awns; the middle one longest, and spiral.

1. *P. Billardieri.* (*Agrotis quadrifida*; Labill. *Nov. Holl. v. 1. 20. t. 22.*)—Native of Van Diemen's land. A small and slender grass, scarcely a span high. *Root* fibrous. *Stems* several, round, striated, with one bent joint near the bottom, and one short leaf, with a long hairy sheath. *Radical leaves* numerous, tufted, short and setaceous. *Panicle* erect, about two inches long, not much branched, of 15 or 20 upright flowers. Valves of the calyx serrated at the keel. *Floret* hairy at its base.

PENTAPOLIS, Πενταπολις, in *Ancient Geography*, &c. a country wherein are five cities.

The Pentapolis of the sacred writings comprehended Sodom, Gomorrah, Adama, Seboim, and Segor; and of these the last only escaped the flames which destroyed the others.

The most celebrated was the Pentapolis Cyrenaica, or Pentapolis of Egypt, whose five cities were Berenice, Arfinoe, Ptolemais, Cyrene, and Apollonia.

Among the ancient geographers and historians we likewise read of the Pentapolis of Lybia, now called *Mesrata*; the Pentapolis of Italy; and the Pentapolis of Asia Minor, which contained Lindus, Jalyffos, Camiros, Cos, and Cnidus. This country once bore the name of Hexapolis, when it comprehended Halicarnassus.

PENTAPTEROPHYLLUM, in *Botany*, a name by which Dillenius has called the meriophyllum of other authors, characterized under that name in the *Genera Plantarum* of Linnæus, p. 459.

PENTAPTOTON, in *Grammar*, a noun which has only five cases.

PENTASTICH, PENTASTICHON, in *Poetry*, a stanza, or division of a poem consisting of five verses.

PENTASTYLE, in *Architecture*, a work wherein are five rows of columns.

Such was the portico begun by the emperor Gallienus, and which was to have been continued from the Flaminian gate to the bridge Milvius, *i. e.* from the Porto del Popolo to the Porte Mole.

PENTATEUCH, in *Sacred Literature*, the five books of Moses at the head of the Old Testament; *viz.* Genesis, Exodus, Leviticus, Numbers, and Deuteronomy. See each of these books under its respective title.

The word is formed from *πεντατευχος*, which signifies the same; compounded of *πεντε*, five, and *τευχος*, volume.

Pere Simon, in his *Hist. Crit. du Vet. Test.* produces a great number of passages to prove, that Moses was not wholly the author of the Pentateuch, as we now have it.

Indeed, those apparent interpolations at the end are sufficient to determine that point; it being absurd to suppose Moses the author of the account of his own death and burial, and of the comparison between him and the succeeding prophets in Israel.

These interpolated passages are usually attributed to Esdras, or Ezra; who, on his return from the Babylonish captivity, is supposed to have published the Old Testament, or at least a part of it, corrected and enlarged. See BIBLE and CANON.

There are two famous Pentateuchs, or editions of the Pentateuch, which have a long time disputed the preference, both as to antiquity, and as to character; *viz.* that of the Jews, called the *Jeruiss*, or *Hebrew* Pentateuch, written in the Chaldean or Assyrian character; and that of the Samaritans, written in the Samaritan or Phœnician character. Each is maintained to be the ancient Hebrew; whereas both seem to be different copies of the same Hebrew original,

written

PENTATEUCH.

written in different characters. The Samaritan Pentateuch was well known to many of the fathers, who have quoted it; and these quotations are all older than the year 600. From that time, for 1000 years, we find no mention of this Pentateuch until about the beginning of the 17th century; when Scaliger, having had notice that it was still preserved by those of that sect, and complaining that no person had taken care to procure a copy, archbishop Usher, by means of Mr. Thomas Davis, then at Aleppo, probably chaplain to the factory there, obtained two or three copies of it out of the East. Not long after, Sancius Harley, a priest of the oratory at Paris, and afterwards bishop of St. Malo's in Brittany, brought another copy into Europe, which he deposited in the library belonging to that order in Paris; from which copy, Morinus, another priest of that order, published it in the Paris Polyglot. The Samaritans, beside the Pentateuch in the original Hebrew, have also a translation of it into the language which was vulgarly spoken among them. This is also published, together with the original, in the Paris Polyglot; and it is so exactly literal, that Morinus thought that one Latin translation might serve for both. Bishop Walton has followed the same method in his Polyglot; only when there are any variations, they are marked at the bottom of the page. This Samaritan Pentateuch has some additions, variations, and transpositions, by which it differs from the present Jewish copies. But it is less a matter of wonder, that there should be some differences, than that there should not be more; considering that those who adhered to the one, and those who adhered to the other, had not only broken off all manner of communication, but had constantly been at the bitterest variance possible for more than 2000 years: for such an interval had elapsed from the apostacy of Manasseh (see SAMARITANS) to the time when these copies were first brought into Europe. In so many ages, many differences might happen by the errors of transcribers; and most of those that occur in these two copies are of this sort. See the sequel of this article.

But the grand difference is in the letter or character; the Jewish being in the Chaldean or Assyrian character, and the Samaritan in the Phœnician, *i. e.* the Canaanitish character: this latter seems to have an advantage over the vulgar Jewish Pentateuch. Yet Prideaux is of opinion, that the latter is only a transcript from the former out of the Chaldean into the old Hebrew character.

One great reason he gives is, that there are many variations in the Samaritan, manifestly occasioned by mistaking the similar letters in the Hebrew alphabet; which letters having no similitude in the Samaritan character, it is evident the variations must have arisen in transcribing from the vulgar Hebrew into the Samaritan; and not the contrary way.

Add to this, that Sæon, Allix, and many other learned men, take the Chaldean or Assyrian character to have been the character always in use among the Jews; and the Samaritan or Canaanitish, or, as it is also called, the *old Hebrew* character, to have never been used by the Jews before the captivity, in any manner, either on books or on medals.

Hence the Pentateuch must have been transcribed into that character; and that, probably, to render it legible to the inhabitants of Samaria, who, upon their introduction of the Pentateuch, might probably be versed in no other character.

Usher takes the Samaritan Pentateuch to have been compiled by Dositheus, a Samaritan, mentioned by Origen to have adulterated the Pentateuch. Dupin supposes it the work of some modern Samaritan, whom he imagines to

have compiled it chiefly out of the different copies of the Palestinian and Babylonian Jews, and the Septuagint, because it sometimes agrees with one, and sometimes with another.

Although, as we have already said, the Hebrew and the Samaritan copies of the Pentateuch agree in the main, they nevertheless differ in many places from one another; and as some of these differences are very considerable, in respect to particular letters and single words, and besides, as several whole verses are now found in the latter, but not in the former, Dr. Kennicott has attempted to establish, as to *some* of these differences, the superior authority of the Samaritan Pentateuch. One text, in particular, (Deut. xxvii. 4.) has constantly been objected to the favourers of this Pentateuch; a text which the advocates for the Hebrew copies have insisted upon as decisive against the Samaritans, and which has been almost invariably admitted to contain so shocking a corruption made voluntarily by the Samaritans, that even the more equitable judges have joined warmly with the Jews on this occasion, and have manifested an inclination to give up the whole Samaritan Pentateuch as of no authority, on account of *this one* (as they apprehend) notorious and undeniable corruption. Among those who have exclaimed loudly on this occasion have been, not only Bootius and the younger Buxtorf, Carpzovius and Leusden, with all their brother advocates for the integrity of the printed Hebrew text, but Hottinger and Lightfoot, Patrick and Calmet, Usher and Du Pin, Prideaux and Watson, father Simon and father Houbigant. To these names we may add that of Mr. Anthony Collins, in his "Grounds and Reasons of the Christian Religion." Against this host of learned men, Dr. Kennicott has appeared as an able advocate for the cause of the Samaritans.

In order to understand the ground of this dispute, we may observe, that God, by Moses, commands the Israelites, when they shall have passed over Jordan into the land of Canaan, "to put the blessing upon Gerizim, and the curse upon Ebal;" two mountains situated in the centre of the promised land between Dan and Beerseba; two mountains near each other, and having between them (at the foot of Gerizim) a small town, anciently called Sichem or Schechem, but afterwards Neapolis, and now Naplofe. The mount, which was to be dignified with the "law" and the "altar," (Deut. xxvii. 4.) is in the Hebrew text *Ebal*, and in the Samaritan *Gerizim*. About 1000 years afterwards, the Samaritans built a temple upon mount Gerizim, which was one of the principal causes of the inveterate hatred that subsisted between the Jews and Samaritans. The text, it has been said, has been wilfully corrupted, either by the Samaritans, who have, in their copies, put Gerizim, instead of Ebal, in order to recommend their temple, or by the Jews, who have, in their copies, put Ebal, instead of Gerizim, from opposition to it. That this corruption was made by the Samaritans, Walton, with whom join expressly Hottinger and Prideaux, affirms to be undeniable, for the following reasons: "cum in omnibus codicibus Hebrais, omnibusque versionibus antiquis, legatur Ebal, non Gerizim." The learned Kennicott has examined these reasons. "Ebal," it is said, "is the word in all the Hebrew copies;" and therefore Ebal is the original word. But this is almost taking the point for granted: for it might as well be said, Gerizim is the original word, because it occurs in the present Samaritan copies. Moreover, "Ebal," it is alleged, "is the word in all the ancient versions." But as the point in dispute relates to a corruption, introduced about 400 years B.C., these versions, being all too late, can be of no use: they can only serve as evidence for the state of the Hebrew

PENTATEUCH.

Hebrew copies from which they were translated, and not for copies five, or six, or seven hundred years later. The Greek version of the Pentateuch was made about 280 years B.C.; but such a version can be no proof, that this text of the Jews had not been altered by *themselves*, 100 years before. This corruption was made, without doubt, either by the Samaritans in favour of their temple, or by the Jews in opposition to it, soon after that temple was built; and it was built, as Prideaux allows, during the reign of Darius Nothus, about 409 years B.C. Hence it is concluded, that all the ancient versions, which have been made from the Hebrew text, being made after the corruption had been introduced, are too late to be admitted as evidences, that can acquit the Jews, or convict the Samaritans. But it is by no means true, that "all the ancient versions read *Ebal* in the text under consideration." For we have an ancient version of the Samaritan Pentateuch, expressed in Samaritan letters, and written in the Samaritan dialect, where is a mixture of Chaldee and Hebrew. This ancient version is of equal, nay, superior, antiquity to the version of the LXX; and this very ancient version reads *Gerizim*, in the disputed text. In some Arabic versions from the Samaritan Pentateuch MSS. preserved in the Bodleian library, the reading is the same. The authority of versions may, therefore, be adduced to oppose the authority of versions. Dr. Kennicott urges several presumptive and positive arguments in vindication of the Samaritans. *Gerizim*, he alleges, is universally allowed to have been the mount of blessings; and it seems very improbable, that the sacrificers of peace-offerings, which implied a state of favour with God, should by divine command sacrifice upon *Ebal*, confessedly the mount of cursings. Moreover, when the Samaritans determined to erect a temple for themselves, after being forbidden to join in rebuilding the temple of Jerusalem, they would, without doubt, choose some place signally honoured by God or his prophets, the more effectually to oppose the fame of the Jewish temple, and the more easily to vindicate their separate worship. *Gerizim* and *Ebal* were two mountains, on the former of which a form of blessings was to be pronounced, and on the latter a form of cursings: and one of these was to be honoured with the "Law of God," and "an altar for divine worship." This altar must have continued there for some hundred years, and the memory and fame of it continued in the country for many hundred years longer. But as both these mountains were near one another, both in the tribe of Ephraim, and both consequently in the possession of the Samaritans, so that either might be the object of their selection for the site of the temple, it is natural to imagine, that they would prefer *that mountain*, which had been, of old and by God's command, the place of his worship. Hence it is inferred, with strong probability, that *Gerizim* was the mountain of worship formerly, and not *Ebal*, which they rejected. Again, the different nature of these mountains furnishes another strong argument for the preference of *Gerizim*. For *this* mountain standing on the south, with its surface declining towards the north, is sheltered from the heat of the sun by its own shade; whereas *Ebal*, looking southward, is more open to the sun falling directly upon it: the former was therefore clothed with a beautiful verdure, while the latter was more scorched up and unfruitful. Besides, about 240 years after one of these mountains had been thus consecrated, when *Jotham* made that beautiful and solemn oration, recorded *Judg. ix. 7*, he must at that time know, which mountain had the law and the altar. Accordingly, he spoke from mount *Gerizim*, with a view of giving greater weight to his address. It is added, that the Samaritans would have been less likely to have wilfully corrupted the law of Moses, if

it be allowed, as ample testimonies prove, that they had a great veneration for it. In the interview recorded in the 4th chapter of *St. John's* gospel between our blessed Saviour and a Samaritan woman, near this mountain, he does not charge the Samaritans with having arrogated to mount *Gerizim* honours which did not belong to it: much less does he say, that *Ebal* had been the mount really honoured by God; and not *Gerizim*, as the fathers falsely pretended. We may also observe, that several instances occur in which our blessed Lord pays a general tribute of respect, either directly or indirectly, to the character of the Samaritans: as in the story of the "Good Samaritan," and also in the fact recorded *Luke, ch. xvii.* But if the Samaritans, on account of their good disposition and general character, be excused from the charge of wilful corruption, a charge of this kind against the Jews would not be the *first* that has been brought against them. Instances of this nature have been adduced by *Dr. Kennicott*, grounded upon the most unexceptionable testimonies. If we recur to the subsisting hatred of the Samaritans with respect to the Jews, and conceive that they might be thus urged to commit any crime from opposition to them, it might be retorted that the hatred of the Jews is at least equally notorious. It is further pleaded, that *Josephus*, the Jewish historian, asserts that the altar to be erected was not to be upon *Ebal*, but between this mountain and *Gerizim*, and rather nearer to the latter; and as he was the declared enemy of the Samaritans, it is not likely that he would have expressly given up the honour of *Ebal*, if he could have supported it. As *Josephus* does not charge the Samaritans with corrupting the text in question, so neither did other ancient Jews. If then the Samaritans have not corrupted their Pentateuch, in this celebrated article, it must be admitted that the Jews have corrupted it, and corrupted not only this text in their Pentateuch, but the corresponding text in *Josua, viii. 30.* For other answers to the objections of *Mr. Collins* against the Pentateuch, we refer to *Dr. Kennicott, ubi infra.* Our author concludes a learned and elaborate dissertation on the Samaritan Pentateuch with the following observation. "It is by no means here intended to recommend the adoption of the Samaritan, in the place of the Hebrew Pentateuch: or so to establish the pretensions of the former as to exclude the latter. One ancient copy has been received from the Jews; and we are truly thankful for it. Another ancient copy is offered by the Samaritans: let us thankfully accept that likewise. Both have been often transcribed; both therefore may contain errors. They differ in many instances; therefore the errors must be many. Let the two parties be heard without prejudice; let their evidences be weighed with impartiality; and let the genuine words of Moses be ascertained by their joint assistance. Let the variations of all the MSS. on each side be carefully collected; and then critically examined by the context, and the ancient version. If the Samaritan copy shall be found, in some places, to correct the Hebrew: yet with the Hebrew copy, in other places, correct the Samaritan. Each copy therefore is invaluable. Each copy therefore demands our pious veneration and attentive study. And I am firmly persuaded, that the Pentateuch will never be underflood perfectly, till we admit the authority of both." *Kennicott's* Second Dissertation.

The Jews read the whole Pentateuch every year; and for this purpose they divide it into paragraphs or sections, which they distinguish into great and small. The great are those which they read in a week, of which there are fifty-four (see *PARASCUE*); and the small regard particular matters. Each greater section, which is denominated by the word which it begins, is divided into seven parts, because they are
read

read by so many different persons: the priest begins, afterwards a Levite; and in the choice of the other readers, respect is paid to the rank of the people. After the text of Moses, they read a paragraph of the paraphrase of Onkelos. The books of the prophets are also divided in the same manner.

PENTATHLON, *πενταθλον*, in *Antiquity*, the five exercises performed at the Grecian games, and for which prizes were proposed.

These exercises were wrestling, darting, leaping, running, and quoit-playing. He who bore away the prize in them all was called *pentathlus*; by the Latins, *quingertio*; as the five exercises themselves were by those latter people called *quingertium*.

Some have pretended that by the word pentathlon no more is to be understood than a game, or trial of skill, consisting of five, and of any five exercises; but however this be, the æstus was not of that nature. It is probable, that the pentathlon did not always consist of the five exercises above-mentioned, because Pausanias informs us (lib. v.), that the Elæans from time to time made frequent changes in the Olympic games. The race in the pentathlon was of the same length with the stadium or simple foot-race, and regulated by the same laws. (See *RACE* and *RUNNING*.) The wrestling was subject to the same regulations with the simple palé, or wrestling. (See *PALÉ*.) In the exercise of leaping, in which the competitors endeavour to leap beyond one another in length, the height of the leap not being taken into the account, the athlete carried in their hands pieces of lead, or some other metal, made in the form of a half circle, not exactly round, but inclining to an oval. In these there was a place made for the fingers to pass through, in the same manner as through the handle of a shield; and with those weights, called *Αλτηρες*, Halteres, the athlete were accustomed to poise their bodies, and swing themselves forward in the leap. Some assistance of this kind seems to have been necessary to enable them to perform any thing like what is related of Phaulus of Crotona, whose leap is said to have been 52 (or, as others say, 55) feet long. For the exercise of quoiting, see *DISCUS* and *QUOITING*. In the exercise of darting, the victory was awarded to him who threw his javelin farther than the rest of his antagonists. However, there were certain limits prescribed, beyond which it was a forfeiture of the prize for an athlete to cast his javelin; and to this custom Pindar himself has frequent allusions. The javelin was sometimes thrown with the bare hand, and sometimes with the help of a theng, wound round the middle. The exercise of leaping in the pentathlon was accompanied by flutes playing Pythian airs, as we are informed by Pausanias.

The candidates in the pentathlon, as well as those in all the other gymnastic exercises, contended naked, and were also anointed with oil. Although some doubts have been suggested with regard to the conditions upon which the victory was awarded in the pentathlon, it is certain, that he who vanquished his antagonist in every one of the five exercises was alone entitled to the crown. If all hopes of gaining the pentathletic crown were lost to him who was vanquished in any one trial, it has been queried why the vanquished should contend any longer? The reply to this question is, that the pentathletes were probably obliged by the laws of the olympic games to go through all the five exercises. Although all the competitors, except one, must have despaired of gaining the crown, even from the first trial, yet they might still be desirous of carrying on the contest through the four remaining exercises, if they had not been required to do it by the olympic laws, either with a view of signaling themselves in some of the other contests, or the hopes of ravishing the

crown from him, by whose victory they had been excluded from the prospect of obtaining it. Pindar, in his thirteenth Olympic ode, congratulates Xenophon of Corinth upon his having gained in one day two olympic crowns; one in the stadium, or simple foot-race, the other in the pentathlon, which, as he says, never happened to any man before. The reason is, that the regimen of a pentathlete, as we are informed by both Epictetus and Arrian, was very different from that of an athlete, who qualified himself for a single exercise alone, as running, wrestling, or any other, whence, as both Plato and Longinus assure us, it seldom happened that a pentathlete, though very eminent in his profession, was able to contend with an athlete in that exercise, as, e. g. running, or wrestling, to which alone he had applied himself altogether. The same observation is applicable to all the athletes in general; who differed from each other in their respective regimens and diets, as much or more than in the several exercises to which they peculiarly applied themselves. West's Pindar, vol. iii.

PENTATONON, in the *Ancient Music*, a concord, by us called the redundant sixth.

It consists of four tones, and a major and minor semi-tone; whence the name, *pentatonon*, q. d. *five tones*.

PENTAUREA, a name given by some fabulous authors to a stone said to have been first found by Apollonius Tyaneus, and to possess the virtues of all the other stones, and to attract them all to it, as the magnet does iron.

PENTECONTARCHA, among the *Ancients*, the captain or commander of a galley, called *penteconteros*.

PENTECONTEROS, *πεντηκοντερος*, a vessel with fifty oars.

PENTECOST, *Πεντηκοστος*, Whitsuntide; a solemn feast of the church, held in commemoration of the descent of the Holy Ghost on the Apostles; as described in the Acts. See *WHITSUNTIDE*.

It has its name from the Greek, *πεντηκοστος*, q. d. *quingagesimus, fiftieth*, because held on the fiftieth day after Easter.

In the ancient church, Pentecost finished the Paschal time, or Easter season; wherein, as Tertullian, St. Jerom, &c. observe, Hallelujah was sung every where, the office celebrated standing, no fasting allowed, &c.

The Jews likewise had a feast they called *Pentecost*, or *Quingagesimus*, solemnized in memory of the laws being given to Moses, fifty days after their departure out of Egypt.

This was the second of the three grand festivals in the ecclesiastical year, at which all the males were to appear before the Lord at the national altar. This feast lasted but one day, and was kept with great mirth and rejoicing. It is called by several names in the Old Testament; as the Feast of Weeks, because it was celebrated seven weeks, or a week of weeks, after the Passover, or rather, after the first day of the feast of unleavened bread; the Feast of Harvest, according to Mede and Bochart, because, as the harvest begun at the Passover, it ended at Pentecost: or, according to others, because at this feast the first fruits of their wheat harvest were brought and offered to God; and the Feast of First Fruits.

PENTECOSTALS, **PENTECOSTALIA**, anciently were pious oblations made at the feast of Pentecost, by the parishioners to their parish-priest; and sometimes by inferior churches or parishes to the principal or mother church.

These parish Pentecostals were also called *Whitsun-farthings*; and their sum was divided into four parts, of which one went to the priest, one to the poor, one towards the repair of the church, and one to the bishop of the diocese.

These are paid still in some few dioceses; being now only a charge

a charge on particular churches, where by custom they have been paid. And if they are denied where they are due, they are recoverable in the spiritual court.

PENTECOSTE, in *Geography*, a river of Canada, which runs into the river St. Lawrence, N. lat. $49^{\circ} 45'$. W. long. $66^{\circ} 45'$.

PENTECOSTE, or *Whitsunday Island*, a small island in the South Pacific ocean, and one of the archipelago of the Great Cyclades, or New Hebrides discovered by M. Bougainville in 1768.

PENTEKILIS, or **PENT EKELIS**, a town of Asiatic Turkey, on the S. coast of Natolia; 30 miles W.S.W. of Meccé.

PENTELESMIS, in the *History of Shell-fish*, the name of the conchæ anatifera of some writers.

The pentelasmis is a genus of animals, composed of a shelly body, affixed to a fleshy and soft pedicle; the body is composed of five valves, and the pedicle is sometimes short, and sometimes long. The animal itself belongs to the tritons.

PENTELEICUM, **MARMOR**, in the *Works of the Ancients*, a name given to a very beautiful and glossy species of white marble, of which many of the columns and statues of larger size of the ancients were made: the Parian marble, from certain cracks and fissures in the strata, seldom affording blocks of more than five feet in length.

PENTELEICUS, in *Geography*, a mountain of Greece; six miles N.N.E. of Athens.

PENTESYRINGUS, in *Antiquity*, a sort of pillory, with five holes; wherein were fastened the legs, arms, and heads of criminals, to prevent their stirring.

PENTEXOCHÉ, a name given by authors to a species of echinites, resembling the ripe fruit of the medlar, and thence called also *mespileus lapis*.

PENTHEMIMÉRIS, *πενθημιμερίς*, compounded of *πέντε*, five, *μισος*, half, and *μερος*, part, in the Greek and Latin *Poetry*, part of a verse, consisting of two feet and one long syllable.

PENTHIER POINT, in *Geography*, a cape on the W. coast of France; six miles S.E. of Point St. Matthew. N. lat. $48^{\circ} 15'$. W. long. $3^{\circ} 17'$.

PENTHIEVRE, a town of France, in the department of the Morbihan, situated on the peninsula of Quiberon, on the E. and W. sides washed by the sea; seven miles N. of Quiberon.

PENTHORUM, in *Botany, appears to have been so called, by Gronovius, from *πέντε*, five, and *ἄρος*, a column or post, in allusion to the figure of the fruit, which he says resembles five turrets. Gron. Virg. 71. Linn. Gen. 230. Schreb. 310. Willd. Sp. Pl. v. 2. 770. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 116. Juss. 308. Lamarck Illustr. t. 390. Michaux Boreal-Amer. v. 1. 278. Gærtn. t. 65.—Class and order, *Decandria Pentagynia*. Nat. Ord. *Succulentæ*, Linn. "*Sempervivis affine*," Juss.*

Gen. Ch. Cal. Perianth inferior, of one leaf, in five or ten deep, acute, permanent segments. Cor. Petals five, rarely wanting, minute, linear, between the segments of the calyx. Stam. Filaments ten, awl-shaped, equal, twice as long as the calyx, permanent; anthers roundish, deciduous. Pist. Germen roundish, with five furrows, coloured; styles five, conical, erect, distant, the length of the stamens; stigmas obtuse. Peric. Capsule simple, five-lobed, of five cells, crowned with the divaricated, nearly horizontal, styles. Seeds numerous, minute, oblong, slightly compressed.

Eff. Ch. Calyx in five or ten segments. Petals five, minute. Capsule of five cells, with five points. Seeds numerous.

Linnæus says *Penthorum* is distinguished from *Sedum*, by wanting the nectariferous scales proper to that genus. But the fruit also differs, though indeed only as that of some species of *Nigella* differs from others. Jussieu has strangely mistaken the structure of the fruit, whose cells, he says, split horizontally; and thence he was led to doubt whether the genus could properly belong to his order of *Sempervivæ*. The seed-vessel however opens exactly like those of *Sedum*, *Sempervivum*, *Cressula*, &c., nor can there be a question of the genus before us belonging to the same natural order.

1. *P. sedoides*. Linn. Sp. Pl. 620. (*Penthorum*; Linn. Aët. Upfal. ann. 1744. 12. t. 2.—Native of moist shady situations, in North America; Michaux says from Canada to Carolina. It is a hardy perennial in our botanic gardens, flowering in July and August. Root fibrous, throwing out creeping scyons. Stems numerous, diffuse, twelve or eighteen inches long, leafy, slightly branched; their opposite angles rough with minute bristles. Leaves alternate, nearly sessile, lanceolate, acute, serrated, smooth, scarcely succulent. Spikes several, terminal, recurved, collected into a sort of corymb. Petals white, some or all of them frequently wanting, while the segments of the calyx are præternaturally multiplied. The plant has no smell, nor any thing more than an herbaceous taste.

PENTICOTTA, in *Geography*, a town of Hindooستان, in the circar of Cicacole; 32 miles S.W. of Cossimcotta.

PENTIDATELO, a town of Naples, in Calabria Ultra; 12 miles S.E. of Reggio.

PENTIMA, a town of Naples, in Abruzzo Citra; five miles N.W. of Salmona.

PENTLAND FRITH, the strait which separates the main land of Scotland from the Orkney islands. It is sometimes called Piceland Frith; and indeed the latter is considered by many writers to be its proper and original appellation. This strait is about twelve miles across, and is remarkable for the impetuosity and opposition of its currents, from the meeting tides of the Atlantic and Northern oceans. So strong are these currents at times, that no vessel can navigate against them, however favourable the wind may be. Hence the navigation of this frith is so peculiarly dangerous and difficult, that few vessels attempt to pass it without the assistance of an experienced pilot. Its dangers are also greatly augmented by several whirlpools, of which those most usually fatal are the "Wells of Swinna" and the "Swalchie of Stroma," near the northern side of that island. On its southern shore is another very hazardous spot, called the "Merry Men of Mey," from the Mey, the name of a gentleman's residence on the opposite coast of Caithness. Here, from the concussion of the opposing tides, the sea is agitated in a very awful manner, even in the finest weather. From these concurrent causes, it is impossible at any time to cast anchor in any part of this frith; which, notwithstanding, is annually entered by between three and four thousand vessels. The number, however, will no doubt rapidly decrease as soon as the Caledonian canal is opened for navigation. Many of the natives of the Caithness coast, and of the islands, are said to derive their livelihood solely from the produce of the numerous ships which are foundered, or dashed to pieces in their passage through this frith. Barry's Orkney Islands, 4to.

PENTLAND SKERRIES, three small islets, or holms, at the eastern entrance to the Pentland frith; four miles N.E. from Dungsby head. Being from their situation extremely dangerous to mariners, a lighthouse is placed upon the largest of them. It was erected in 1794.

PENTLAND HILLS, a range or ridge of eminences, which extend from a place about four miles S.W. of Edinburgh, towards

towards the confines of Peebles-shire and Lanarkshire. Some of these hills are of considerable elevation; particularly the western summits, two of which, called Capelaw and Caerketan-craig, rise to the height of nearly fifteen hundred feet above the level of the sea. Logan-house hill even exceeds seventeen hundred feet above the same level. The eastern division, near Edinburgh, however, seldom reaches much above one-half that elevation; in some places it is nearly flat on the top, and affords excellent pasturage for large flocks of sheep. Several streams, noted in song, take their rise among these hills; as the North Esk, Glencrofs, and Logan water; the two latter of which dispute the honour of being the scene of Allan Ramfay's "Gentle Shepherd." Each of these vales is accordingly distinguished by the name of "Habby's Hough;" and both are frequently visited by poetical parties from the Scottish metropolis during the summer months. The composition of the Pentland hills is principally granite, but on the north side of the Logan summit is a rock of a very singular character, which has obtained the appellation of "Petunse Pentlandica," from its resemblance to the substance employed in the manufacture of Chinese porcelain. It is the only specimen of the kind in Great Britain, and probably in Europe.

PENTODRYON, in *Botany*, a name given first by the Greek writers, and after that by the Romans, to a kind of *strychnum* or *nighshade*, which caused madness in those who eat of it. This was called by others *manichum strychnum*, and by some simply *manicum*.

PENTOPHTHALMOS, in *Ichthyology*, the name of an East Indian fish, approaching to the European *liparis*, or *butterfish*, but larger, and called by the Dutch there *vijsvogel*. It has these names from five round spots in the tail-fin, resembling five eyes; it is of a yellowish colour, and is covered with a smooth skin, having no scales; its body is thick, its head small, its beak long; it has two red fins, and its tail is blueish; it is an inhabitant of the fresh waters, and is a very well tasted fish.

PENTOROBOS, in *Botany*, a name recorded in Pliny as belonging to the Pæony. It is formed of *πέντε*, *five*, and *οροβος*, a *vetch* or *legume*, evidently alluding to the fruit of that plant, which, when perfect, consists of five seed-vessels, that have very much the appearance of legumes. See **PÆONIA**.

PENTOWEN POINT, in *Geography*, a cape on the S. coast of Wales, in the Britol channel. N. lat. $51^{\circ} 45'$. W. long. $4^{\circ} 15'$.

PENTSTEMON, in *Botany*, from *πέντε*, *five*, and *στέμα*, a *stamen*; because this genus is distinguished from its allies in the *Didymia Angiospermia*, by having a fifth stamen, more or less perfect, in addition to the four unequal ones, which make the character of the class. Mitchell Ephem. Nat. Cur. v. 8. append. 214. Ait. Hort. Kew. ed. 1. v. 3. 511. Schreb. 808. Willd. Sp. Pl. v. 3. 227. Mart. Mill. Dict. v. 3. Michaux Boreal-Amer. v. 2. 21. (Chelone; Lamarck Illustr. t. 528.)—Class and order, *Didymia Angiospermia*. Nat. Ord. *Personate*, Linn. *Bignonia*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five deep, lanceolate, nearly equal, permanent segments. *Cor.* of one petal, two-lipped; tube longer than the calyx, gibbous at the base on the upper side, dilated upwards, and there most inflated at the lower side, or front; upper lip erect, in two ovate obtuse segments; lower lip longest, in three deep, ovate, obtuse, deflexed segments, shorter than the tube. *Stam.* Filaments four, thread-shaped, diverging at the summit, inserted into the tube and not extending beyond it, the two inferior ones longest; anthers roundish,

distant, inclosed within the tube, cloven, their lobes divaricated. The rudiment of a fifth filament is inserted into the tube, between the two uppermost stamens, about equal to them in length, thread-shaped, straight, bearded at the upper part. *Pist.* Germen superior, ovate; style thread-shaped, the length of the tube, deflexed at the top; stigma abrupt. *Peric.* Capsule ovate, acute, compressed, of two cells and two divided valves, with inflexed margins. *Seeds* numerous, orbicular, bordered. *Receptacle* large, flattish, meeting the inflexed margins of the valves.

Ess. Ch. Calyx in five deep segments. Corolla inflated, two-lipped. Rudiment of a fifth filament bearded above. Capsule of two cells; the partition from the inflexed margins of the valves. Receptacle parallel to the valves.

Obs. We cannot perceive the necessity of separating this genus from **CHELONE**, nor should we here have done any thing more than refer to the labours of our learned and judicious predecessor, the late Rev. Mr. Wood, under that article, had not *Pentstemon* been now so generally adopted. We must remark however, that Jussieu, who hints at its establishment under *Chelone*, Gen. 137, errs in attributing to the latter a capsule with partitions from the centre of each valve, and a receptacle contrary to the valves. There is no difference between the fruit of these genera in that respect, nor in any other, except the trivial circumstance of the valves of *Pentstemon* being split vertically, which is not the case with *Chelone glabra* at least, if we may rely on Gærtner, t. 54; for this plant does not, under our observation, perfect its fruit. The seeds are bordered in *Pentstemon* as well as *Chelone*.

For the species of *Pentstemon*, see **CHELONE**, section 2. To these we have only the following to add.

5. *P. ferrulata*. Menz. MSS.—Stem smooth. Leaves all sharply serrated, smooth; the upper ones ovate, somewhat hastate. Panicle twice or thrice forked. Barren filament bearded half way down.—Gathered by Mr. A. Menzies, on the west coast of North America. It is most nearly related to *P. levigata*, but differs in the copious acute serratures of its leaves, which are also broader, shorter, and more ovate; particularly those on the middle and upper part of the stem. The panicle is also more compact. Barren filament linear, bearded on one side, from the summit more than half way down. *Capsule* like that of *levigata*.

PENTSTEMON, in *Gardening*, contains plants of the hardy, herbaceous, flowering kind, of which the species cultivated is, the smooth pentstemon (*P. levigata*.)

Method of Culture.—This plant may be increased by sowing the seeds either in the autumn or early spring in the places where they are to remain, or in beds, to be removed in the beginning of the summer to the borders or clumps of the pleasure-grounds.

They afford variety among other plants of similar growth in these situations.

PENTZIA, in *Botany*, so named by professor Thunberg in honour of his pupil Charles John Pentz, at whose graduation at Upsal, in 1797, the learned professor's dissertation on *Diosma* was published. Thunb. Prodr. (præf. n. 54.) 145. Willd. Sp. Pl. v. 3. 1808.—Class and order, *Syngenesia Polygamia-aqualis*. Nat. Ord. *Compositæ discoideæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common calyx* hemispherical, of many imbricated, oblong, obtuse, membranous-edged scales. *Cor.* compound, discoid. Florets all fertile, numerous, uniform, level-topped, tubular, funnel-shaped; the limb erect, in five slight segments. *Stam.* Filaments five, capillary; anthers united into a cylindrical tube. *Pist.* Germen oblong; style thread-shaped, the length of the stamens; stigmas two, spreading.

spreading. *Peric.* none, except the permanent calyx. *Seeds* solitary, abrupt, angular, striated, each with a membranous, cup-shaped, angular *corolla*, half its own length, in five unequal, rounded, shallow segments. *Recept.* naked.

Eff. Ch. Receptacle naked. Seeds crowned with a membranous, unequally lobed, border. Calyx imbricated, hemispherical. Florets all tubular, five-cleft.

1. *P. flabelliformis*. Willd. n. 1. (*P. crenata*; Thunb. Prodr. 145. *Tanacetum flabelliforme*; L'Herit. Sert. Angl. 21. t. 27. Ait. Hort. Kew. ed. 1. v. 3. 169. *Gnaphalium dentatum*; Linn. Sp. Pl. 1194. *Coma aurea incana*, foliis obtusis tridentatis, capitulis oblongis; Burm. Afric. 185. t. 68. f. 3.)—Native of the Cape of Good Hope. Mr. Masson sent it to Kew in 1774. This is a bushy much branched *shrub*, altogether of a hoary silvery aspect, remarkable for its little alternate, fan-shaped, long-stalked *leaves*, furnished with prominent longitudinal ribs, and strongly toothed at their abrupt termination. *Corymbs* simple, terminal, but soon surmounted by young branches. *Flowers* the size of a pea, yellow, with a downy somewhat thinning *calyx*. The plant is slightly aromatic. It might perhaps have been allowed to remain in *Tanacetum*, the very conspicuous white *seed-crown* being little more than a dilatation, of what always exists, in some degree, in that genus, and the want of a few female three-cleft *florets*, justly termed obsolete, in the *radius*, being at best an obscure, if not variable character.

PENKONDA, in *Geography* a town of Hindoestan, in Myfore; 65 miles N. of Bangalore.

PENULA. See PÆNULA.

PENULTIMA, or PENULTIMATE, formed from *pene*, and *ultimus*, almost last, in *Grammar*, denotes the syllable, or foot, immediately before the last.

Hence antepenultimate is that before the penultimate, or the last but two.

PENULTIMATE, in *Musical*. M. Broffard will have it the same with what the Greeks call *paranete*; though others will not allow the *paranete* to be the penultimate chord, but the next to it.

PENULTIMATE of the *Separate*, *paranete diazeugmenon*, is a name the ancients gave to one of the chords of their lyre or system; corresponding to the *d, la, re*, of the third octave of the modern system.

PENULTIMATE of the *Acute*, *paranete hyperboleon*, a chord of the ancient system, answering to the *g, re, sol*, of the third octave of the modern system.

PENUMBRA, in *Astronomy*, a faint or partial shade, observed between the perfect shadow and the full light in an eclipse.

The penumbra arises from the magnitude of the sun's body; were he only a luminous point, the shadow would be all perfect; but by reason of the diameter of the sun, it happens that a place which is not illuminated by the whole body of the sun, does yet receive rays from a part thereof.

Thus, suppose S the sun (*Plate XVIII. Astron. fig. 17.*) and T the moon, and the shadow of the latter to be projected on a plane, as G H. The true proper shadow of T, viz. G H, will be encompassed with an imperfect shadow, or penumbra, H L and G E, each portion whereof is illuminated by an entire hemisphere of the sun.

The degree of light or shadow of the penumbra will be different in different parts, as those parts lie open to the rays of a greater or lesser part of the sun's body; thus from L to H, and from E to G the light continually diminishes; and in the confines of G and H, the penumbra

becomes lost and confounded with the total shade; as, near E and L, it is confounded with the total light.

A penumbra must be found in all eclipses, whether of the sun, the moon, or the other planets, primary or secondary; but it is most considerable with us in eclipses of the sun; as in the case here referred to.

In eclipses of the moon, the earth is encompassed indeed with a penumbra; but it is only sensible to us on the earth near the total shadow: an observer placed on a plane, whereon the shadow falls, might observe the whole penumbra, as in eclipses of the sun. Thus an eye placed at I or F, would only see the semidiameter of the sun; the rest being hid behind the moon. Going from I towards H, more and more of the sun is hid, till it be lost in the shadow itself, &c.

Hence we have eclipses of the sun when the shadow never touches the earth, provided the penumbra do but reach it: and hence there is a difference observed in eclipses of the sun, as the shadow itself, or a greater or less degree of the penumbra, passes over a place. But eclipses of the moon appear the same in all places where they are visible.

When the shadow itself falls on the earth, the eclipse is said to be total or central; when only the penumbra falls on it, the eclipse is said to be partial.

The penumbra extends infinitely in length, inasmuch as to each point of the diameter of the sun, there answers a space infinite in length, into which no rays enter from that point, though there do from others. Two rays drawn from the two extremities of the earth's diameter, and which proceed still diverging, form the two edges of the penumbra; which, of consequence, is continually growing in width, and is infinite also in this sense. All that infinite space is the penumbra; except the triangle of the shadow included in it.

The figure of this space comprehending the shadow, is a trapezium, one of whose sides is the diameter of the earth; the opposite side parallel thereto is an infinite line, *i. e.* the width of the penumbra projected to infinity, and the two other sides are two rays drawn from the two extremities of the diameter of the sun, through those of the diameter of the earth, and which, prolonged back beyond the sun, will intersect in a certain point, making an angle equal to the apparent diameter of the sun; which angle may be called the *angle of the penumbra*.

Now the penumbra will be the greater, as this angle, or which is the same thing, as the star is greater, the planet remaining the same; and if the diameter of the planet be increased, the star remaining the same, it will be the same as if the diameter still receded from the angle of the penumbra.

In order to determine how much of the surface of the earth can be involved in the penumbra, let us suppose the apparent semidiameter of the sun to be the greatest, or about $16' 23''$, which is when the earth is in her perihelion. Let A B D (*fig. 18.*) be the earth, L the moon, and A M B half the angle of the cone, which is equal to $16' 23''$; whence we shall find its height L M = $58\frac{1}{2}$ semidiameters of the earth. (See SHADOW.) Let the moon be in her apogee, and, therefore, at her greatest distance from the earth, which is 64 semidiameters of the earth, and T M = T L + L M = $122\frac{1}{2}$ semidiameters. But T B : T M :: sine of T M B : sine of M B N or M B T; and T B : T M :: 1 : $122\frac{1}{2}$, and the angle T M B = $16' 23''$, therefore the angle M B N = $35^\circ 42' = T M B + M T B$. Consequently M B N - T M B = ($35^\circ 42' - 16' 23'' =$) M T B = $35^\circ 25\frac{1}{2}'$, which is the measure of the arc A B; whole

whose double $70^{\circ} 51'$ is equal to the arc $C A B$, or about 4900 English miles. See ECLIPSE.

M. de la Hire examines the different degrees of the penumbra, and represents them geometrically by the ordinates of a curve, which shall be among themselves, as the several parts of the sun's disc, with which a body placed in the penumbra is enlightened.

PENURIE, in *Geography*, a town of Hindoostan, in Bahar; 23 miles S. of Bahar.

PENUTURA, a town of Hindoostan, in the circar of Cicacole; 25 miles N. of Cicacole.

PENY, a town of Hindoostan, in Bahar; 24 miles S.W. of Rotafgur.

PENYCUIK, is the name of a village and parish in the county of Mid-Lothian, or Edinburghshire, Scotland. The village is situated nine miles S. from the northern metropolis, and is adorned with a very handsome church, the living of which was formerly a rectory. This edifice is placed on the site of an older structure, which was dedicated to Kentingern, popularly called St. Mungo. The parish is twelve miles in length and six in breadth. Its surface is extremely various, and exhibits almost every kind of soil, from clay and moss to the poorest gravelly loam. A great number of sheep are bred in this parish; but the greater proportion of it is under tillage. It is watered throughout its whole extent by the river North Esk, and abounds with coal and peat. It also possesses several objects entitled to the attention of the topographer and the antiquary. Near the village is the elegant seat of Sir James Clerk, bart. M. P. for the county of Edinburgh. The situation of this mansion is delightful; and its prospects are both picturesque and extensive. In the library here is an excellent collection of books and paintings; and in another room is a large assortment of Roman antiquities, principally from the wall of Antoninus, and the neighbouring encampments. Close to the river, within the "policy," is Offian's Hall, the much admired work of Runciman; and behind the house is an exact model of the celebrated Roman temple, called by Buchanan *Templum Termini*, which formerly stood on the banks of the Carron, and which was known to the vulgar by the appellation of Arthur's Oon. Here is likewise an obelisk, in honour of Ramsay the poet, who frequently resided at Penycuik, and is supposed to have laid the scene of "The Gentle Shepherd" on the confines of this parish and Gleserofs. About two miles from this seat, lower down the river, stood the ancient castle of Brunstone, the baronial mansion of the Crichtons, some ruins of which still remain. New-Hall, another residence of the same family, stands three miles N.W. from the village. It is supposed to have derived its appellation of *New* from the circumstance of its occupying the site of an *old* religious house. The name of New-House, an inn on the lands of Spittal here, boasts a similar derivation, having been erected to supply the place of an ancient hospitium, for the accommodation of travellers. Even at the present day the weary and benighted traveller is considered as entitled to shelter and protection; and accordingly one of the out-houses, at the Old Spittal, is usually appropriated to that purpose. Traces of several encampments of different forms and eras are yet visible in this parish. Raven-Nook-Castle, situated on the Esk, belonged to the Sinclairs of Roslyn. Government has lately converted the buildings of two large paper manufactories here into depots for prisoners of war.

According to the parliamentary returns of 1811, the houses in this parish amount to 309 in number, and the inhabitants to 1827. Beauties of Scotland. Carlisle's Topo-

graphical Dictionary of Scotland, and of the Islands of the British Seas, 4to. 1813.

PENZA, a town of Russia, and capital of a government, near the Sura; 644 miles S.E. of Petersburg. N. lat. $53^{\circ} 50'$. E. long. $45^{\circ} 42'$.

PENZANCE, a sea-port and market town in the west division of the hundred of Penwith, county of Cornwall, and the most westerly town in England, is situated on the N.W. side of Mount's bay, 287 miles W.S.W. from London, and 10 miles from the Land's End. It is particularly distinguished for the cheapness of its fish market, the mildness of its climate, and the fertility of the neighbouring lands: these circumstances have occasioned a considerable increase of population, by the influx of inhabitants from the adjacent villages. In the year 1595, the Spaniards dispatched four vessels from Bretagne, (of which they were then masters,) to invade the English coast. They landed near Mousehole, which they burnt, together with the church of St. Paul. Meeting with little resistance, the enemy proceeded to Penzance, and the inhabitants deserting it, they entered the town in three places, and set it on fire, after which they returned to their galleys. The returning courage and increased numbers of the Cornish, prevented the Spaniards from re-landing, and Penzance has since remained undisturbed by foreign foes. The parish church is situated nearly at Madern, two miles from the town; but there is a chapel of ease nearer home, dedicated to St. Mary. There are various religious denominations residing here; Presbyterians, Quakers, Methodists, and Jews, who have separate places of worship. The government is vested in a corporation, consisting of a mayor, recorder, twelve aldermen, and twenty-four common-councilmen. Penzance is one of the four Stannary towns of the Cornish tin mines, and the petty sessions for the west division of the hundred of Penwith are holden here. There is a charity school endowed by John Buller, esq. of Morval, in 1711. The town is very pleasant, many of the houses large and respectable, and most of the streets are paved. A new pier, which was erected by the corporation some years since, affords much convenience to the considerable trade carried on here, consisting chiefly of tin, and the pilchard fishery. The packets which form the principal mode of conveyance to the Scilly islands, sail from Penzance. Thursday is the market day, and there are three annual fairs. By the census of 1811, Penzance contained 794 houses, and a population of 4022 inhabitants.

At the distance of half a mile from Penzance, are some remains of the celebrated Wherry Mine. They are situated in a part of the bay, which is dry at low water, but covered by every returning tide to the depth of several feet. The peculiar situation of this mine rendered it an object of curiosity, although the shaft is filled up, and the frame-work nearly annihilated. When the works were in operation, the labour became extremely adventurous; the miners working at the depth of seventeen fathoms below the waves, nearly 120 fathoms from the shore, and momentarily menaced with an inundation of the sea, which roared above them. The dangerous situation of the shaft, the injurious effect of storms and tides, and a partial failure of the lode, induced the proprietors to discontinue its working in 1798. A large tract of marsh-land, adjacent to Penzance, subject to occasional inundations of the sea, has been partly rescued from sterility and waste, through the laudable exertions of Dr. Samuel Moyle of Marazion. It was effected by means of an aqueduct or pipe, communicating with the sea, which carried off all the drainage water from the marsh. Several crops of corn and potatoes have been obtained from the parts so saved, and it promises to reward the adventurer for his expence

and perseverance. In cutting one of the drains, an earthen pot was discovered, containing nearly one thousand Roman copper coins, which the impressions shew to have been issued between the years A.D. 260 and 350.

West of, and contiguous to, Penzance are several small villages and antiquarian objects deserving notice. Mousehole, on the western side of Mount's bay, is celebrated among antiquaries for having been the residence of Dolly Pentreath, one of the last persons known to speak the Cornish language. She lived to the great age of 102, and was buried in the parish church-yard of St. Paul's. St. Burien is the name of a parish, which, though at present consisting only of a few wretched cottages, was formerly distinguished by a college of Augustine canons, founded and endowed by Athelstan about the year 930. It is now in the patronage of the prince of Wales. The deanery includes the parishes of Burien, Senner, and St. Levan. At the Norman conquest there were secular canons here, and in the 20th of Edward I. a dean and three prebends. The church is built on a high spot of ground; it consists wholly of granite, and its tower forms a conspicuous object from the Land's End, the Scilly islands, and the North and South channels. The greater part of the district round St. Burien, though wild and unsheltered, is interesting to the antiquary, it being interspersed with cairns, circles, cromlechs and other Druidical remains. In the parish of St. Paul is a circular inclosure of stones, called the "Roundago," fifty-two paces from north to south, and thirty-four from east to west. Some of the stones are erect, others piled in a wall-like form, but without mortar. In the parish of Senner is a circle of similar shape and character, and at Tredineck another of the same kind. In the parish of Burien is a small circle of nineteen upright stones, called the "Dance Maine" or the Merry Maidens. The stones are about four feet above the ground, and five feet distant from each other; the diameter of the circle is about twenty-five feet, and at some distance north-west from it are two taller upright stones, called the Pipers. Another of these Druidical circles is named Boscawen-un, which also consists of 19 upright stones, and is about 25 feet in diameter, having a single leaning stone in the centre. In the parish of Gulval is Boskednan-Circle, consisting also of 19 stones, but of smaller diameter than the two former. In the parish of St. Just is a considerable structure of this kind, known by the name of the Botallach circles, composed of four circles of upright stones intersecting each other. Lanyon Quoit is a cromlech, consisting of four upright stones, three of which support the other, a broad flat stone, 28 feet long, by 14 wide. In the parish of Morval is a cromlech, similar to this last, but of smaller dimensions, called Chûn Quoit; and half a mile east of Senner church is another, the quoit of which is supported by a barrow heaped round it, 14 yards in diameter. In the parish of Madern stand three stones erect, on a triangular plane, the middle one of which is perforated with a large hole near the base, nine inches in diameter. Dr. Borlase conjectures that this perforation was appropriated to superstitious rites, in the days of Druidism.

The same antiquary described various logan or rocking-stones, as formerly extant in this part of Cornwall; the most considerable and curious of which was at Treryn-Castle, in the parish of St. Levan. The chief stone is an immense granite block, supposed to weigh nearly 90 tons, poised on the top of a vast pile of rocks which project into the sea. This enormous mass, it is stated and believed, was once liable, from a peculiarity of position, to be moved to and fro. Treryn-Castle is a large piece of rocky ground, projecting into the sea, and inclosed by two formidable ramparts and ditches,

one within the other, stretching in a semicircular form from the sides of the cliffs: the perpendicular rocks form three sides of this fortification, and the land side is guarded by these thick and high embankments. About a mile and a half west of this, the cape, called Tolpedn-penwith, is divided from the main land by a stone wall. The castles, Karnijack and Boscagell, in the parish of St. Just, are also of the same kind, as well as many others on the sea-coast.

The Land's End is the most westerly promontory in England. It is a point of huge and ragged rocks, forming a barrier to the tumultuous sea, of the most awful and wildly sublime kind. It was called Bolerium by Ptolemy; by the British bards Penringhued, or the promontory of Blood; and by their historians Penwith, or the promontory to the left. Near this craggy cliff are three caverns, in which the agitated waters occasionally roar with tremendous fury. Several masses of rock are seen above the surface of the sea, more than two miles west of the Land's End, called the "Long Ships." On the largest a light-house was erected by Mr. Smith, in 1797, who obtained a grant for that purpose, and is rewarded by a certain rate on all ships that pass the Land's End. Beauties of England and Wales, vol. ii. Borlase's Antiquities of Cornwall, folio. History and Antiquities of Cornwall, by R. Polwhele, 4to.

PENZENSKOE, a government of Russia, bounded on the north by Nizegorodskoi, on the east by Simberskoe, on the south by Saratovskoe, and on the west by Tambovskoe; about 172 miles from east to west, and from 40 to 60 from north to south. The capital is Penza. N. lat. $52^{\circ} 40'$ to $54^{\circ} 36'$. E. long. 42° to 47° .

PENZINSKAIA, a gulf of Russia, at the north part of the Penzinskoe sea. N. lat. 61° to 62° . E. long. $162^{\circ} 14'$.

PENZINSKOE SEA, a large bay of the North Pacific ocean, between Russia and Kamtschatka, north-east of the sea of Ochotsk; about 320 miles in length, and from 120 to 160 broad. N. lat. 58° to 62° . E. long. 152° to 161° .

PENZLEIN, a town of the duchy of Mecklenburg; 37 miles S.E. of Gustrow.

PEONY, or PIONY, in *Botany*. See PÆONIA.

PEORY, in *Geography*, a town of Hindoostan, in Dowlatabad; 35 miles N.N.W. of Darore.

PEP, and PEPIA. See PIP.

PEPASMUS, $\pi\epsilon\pi\alpha\sigma\mu\varsigma$, in *Medicine*, the digesting and ripening of morbid humours.

PEPASTIC, or PEPTIC, $\pi\epsilon\pi\alpha\sigma\tau\iota\kappa\omicron\varsigma$, or $\pi\epsilon\pi\tau\iota\kappa\omicron\varsigma$, formed from $\pi\epsilon\pi\alpha\sigma\mu\varsigma$, to digest, or ripen, a kind of medicament of the consistence of a plaster; proper to bring vitious and corrupt humours to a head, and dispose them for suppuration.

Butter, roots of mallows, of fleurs-de-lys, onions, and leaves of oxylapathum, are esteemed good pepastics, or maturatives.

The word is also used for such medicines as promote the digestion of food in the stomach.

PEPECHAISSINIGAN, in *Geography*, a river of Canada, which runs into the St. Lawrence, N. lat. $48^{\circ} 26'$. W. long. $68^{\circ} 55'$.

PEPERAH, a town of Hindoostan, in Gurry Mundela; 10 miles S. of Gurra.—Also, a fort of Hindoostan, in Bahar; 48 miles E. of Durbungah. N. lat. $26^{\circ} 8'$. E. long. $86^{\circ} 58'$.

PEPERALLY, a town of Hindoostan, in Bahar; 30 miles N. of Durbungah.

PEPERIA, a town of Hindoostan, in Bahar; 54 miles E.S.E. of Hajypour.

PEPIN LE GROS, in *Biography*, a celebrated person in French

French history, who was surnamed *d'Heristal* from the place of his birth, on the river Meuse, near Liege. He governed Austraia after the death of Dagobert II. in 680, and was defeated in the following year by Ebroin, the powerful mayor of the palace of Neustria. He, however, levied new troops, and, after the death of Ebroin, defeated king Thierry, gained possession of Paris, and became master of the king and kingdom, with the title of mayor of the palace of Neustria and Burgundy. He was a man of extraordinary qualities, extremely brave, prudent, and politic; and one who was able to conceal his ambition under the mask of moderation, and a very mild and affable demeanour. When he had seized the reins of government, he employed himself with vigour and industry to correct abuses, restore law and order, repair the finances, and secure the obedience of all ranks of the state. He suffered Thierry to act the pageant of a king, and in public paid him all possible respect, while he excluded him from any share in the administration. After the death of Thierry, he placed the crown successively upon the heads of his sons, Clovis and Childebert, and his grandson Dagobert, who in French history are denominated, from their insignificance, "Les Rois Faineans." In the mean time, Pepin was engaged in wars with the Frisians and Germans, over whom he was constantly victorious. His excessive power excited the envy of some lords, who, while he was labouring under a dangerous illness, took up arms and assassinated his son Grimoald. He, however, recovered, and took severe vengeance on his foes. Shortly after this he died, having had the administration of the government in his hands nearly 30 years. This was in the year 714, and he left his authority so well established, that he nominated his young grandson, Theobald, mayor of the palace, under the guardianship of his widow. Pepin was father of Charles Martel, the founder of the Carolingian line of French kings. *Univer. Hist. History of France, 1790.*

PEPIN, surnamed *Le Bref*, first king of France of the second race of kings, was the second son of Charles Martel. (See FRANCE.) His father, in his last illness, divided his dominions between his sons, Carloman and Pepin: assigning to the former Austraia, to the latter Neustria and Burgundy. They united in suppressing an insurrection, and afterwards turned their arms against Odilon, duke of Bavaria, and other German princes and nations, whom they reduced to submission. In the midst of this prosperity, Carloman, disgusted with the world, retired to a monastery in 746, and resigned his possessions to Pepin. This prince had hitherto exercised the royal authority in the name of king Childeric; but finding himself perfectly established in his power, beloved by his people, respected by the nobles, and favoured by the clergy, to whom he had restored part of the property which his father had taken from them, he resolved, in the year 751, openly to assume the title, as well as the office, of king. The elder historians unanimously affirm, that the assembly of the states sent a deputation to pope Zachary, to ask whether it were not right that he who exercised all the functions of royalty should be king, rather than he who was so only in name; and that the pope pronounced in the affirmative. From this time it is probable that king Childeric was shaved, and shut up in a monastery, where he soon died; his queen was put into a convent; and their son, Thierry, passed his life in the character of a monk: and thus ended the race of Merovingian kings of France.

Pepin, soon after being proclaimed king, was consecrated at Soissons by Boniface, bishop of Mentz, the pope's legate, and is said to have been the first French king on whom this

ceremonial was performed. The solemnity was, without doubt, intended to give an additional sanctity to his character. With the same view he undertook, on various occasions, to be the champion of the church. He severely chastised the heathen Saxons, who had taken up arms, and expelled the millionaries. He attacked the Saracens in the southern provinces of France, and, after a long siege, made himself master of the important city of Narbonne. Of such importance was Pepin now in the world, that pope Stephen III. implored his protection against the enemies that pressed upon him, and even came in person to his court. He was received with all possible respect; and in return for his kindness, the holy pontiff crowned him and his queen in the church of St. Denis, bestowed the royal unction upon his sons Charles and Carloman, and conferred upon the father and his sons the title of Roman patrician. Pepin reconducted the pope to Italy with an army, besieged the king of the Lombards in Pavia, and obliged him to make a treaty, by which he relinquished the sovereignty of Rome, and all his conquests. As soon as Pepin had recrossed the Alps, the Lombard monarch broke the treaty, and invested Rome. Pepin passed again into Italy, and constrained him to accept of peace a second time, but on much harder conditions than before. He visited Rome, where he was received with great honour as its deliverer, and caused the keys of Ravenna and the other cities of the exarchate to be offered on the throne of St. Peter. As soon as he returned, he employed himself in regulating the internal affairs of his kingdom, and receiving the homage of the duke of Bavaria, and of the king of the Slavonians. A general revolt of the Saracens again gave occasion to him to exercise his arms, and he reduced them to submission. While he was thus engaged, the Lombards, under king Desiderius, attacked the pope, who applied to Pepin for his assistance, which in this and other instances he readily afforded. Pepin died in 768, at the age of 53, after having reigned with glory and success nearly 17 years. No author of a revolution ever met with less disturbance in maintaining his power, which was owing to his great prudence, and the moderation with which he exercised his authority; consulting the general assembly of the nation on all important occasions, and passing his laws by the medium of their assent. In person Pepin was very short, but he possessed extraordinary vigour and activity, as well as intrepidity. The fame of Pepin, like that of Philip of Macedon, has been in some degree impaired by the superior renown of his son, Charlemagne; but his eminent qualities sufficiently entitle him to a place among the great men of his age and nation. *Univer. Hist. History of France, 1790.*

PEPIN *Lake*, in *Geography*, an expansion of the Mississippi, where it receives the Chippeway from the north-east, in N. lat. 44° 5', and W. long. 93° 42', below the Falls of St. Anthony.

PEPITA, in the *Materia Medica*, a name given by some authors to the *fabia sancti Ignatii*, or St. Ignatius's bean.

PEPLION, or PEPLOS, names given by the ancients to medicines which they used as brisk cathartics to purge off the bile and other humours.

PEPLIS, in *Botany*, a name borrowed from Dioscorides, whose *πεπλις*, nevertheless, is evidently the Linnæan *Euphorbia Peplis*, and essentially different in characters and qualities from the genus of which we are about to treat. *Linn. Gen. 176. Schreb. 235. Willd. Sp. Pl. v. 2. 243. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 389. Prodr. Fl. Græc. Sibth. v. 1. 244. Ait. Hort. Kew. ed. 2. v. 2. 316. Juss. 333. Lamarck Illustr. t. 262. Gærtn. t. 51. (Portula;*

(Portula; Dill. Giff. 120. append. 135. t. 7.)—Class and order, *Hexandria Monogynia*. Nat. Ord. *Calycanthema*, Linn. *Salicaria*, Juss.

Gen. Ch. *Cal.* Perianth of one leaf, bell-shaped, plaited, permanent, large; its border in twelve small segments, alternately reflexed. *Cor.* Petals six, ovate, very minute, inserted into the border of the calyx, often wanting. *Stam.* Filaments six, sometimes but four, awl-shaped, short; anthers roundish. *Pist.* Germen ovate, in the bottom of the calyx; style very short; stigma orbicular. *Peric.* Capsule nearly globose, with two longitudinal furrows, membranous, not burbling, of two cells, the partition opposite to the furrows. *Seeds* numerous, minute, obovate. *Receptacle* rather compressed, in the middle of the partition.

Eff. Ch. Calyx bell-shaped; its border in twelve segments. Petals six, inserted into the calyx. Capsule superior, of two cells, not burbling.

1. *P. Portula*. Common Water-Purflane. Linn. Sp. Pl. 474. Curt. Lond. fasc. 4. t. 27. Engl. Bot. t. 1211. Fl. Dan. t. 64.—Native of waters axillary, solitary. Leaves stalked.—Native of flowery places, in various parts of Europe; common in England, flowering in July and August. The modern Greeks call it *αδρακλίδα*, or *αδραχύν*, and eat it in salads, or in soups. The root is annual. Herb smooth, pellucid and somewhat succulent. Stems prostrate, or floating, weak, simple, leafy. Leaves opposite, stalked, obovate, obtuse, entire, a quarter or half an inch long. Flowers axillary, solitary, sessile, small, reddish. Petals fugacious, and often wanting. Capsule pellucid.

Willdenow says the *P. tetrandra* of Linnæus is a *Hedyotis*, of which indeed it has all the appearance. He adds, in its stead, the following new species, for the genus of which we must depend on him, not having seen the plant ourselves.

2. *P. indica*. Willd. n. 2.—Flowers spiked, bracteated. Leaves sessile.—Native of the East Indies. “Stem ascending, square, smooth, six inches or more in height. Leaves opposite, oblong-obovate, abrupt, entire, veiny, smooth. Spikes axillary, simple, longer than the leaves. Flowers sessile, opposite, each accompanied by a lanceolate bractea, twice its own length. Calyx with only eight teeth. Petals wanting. Stamens four.” Willd.

PEPLIUM, a name given by the ancient Greek writers to a shrub which had pinnated leaves and papilionaceous flowers. It is translated by many *jena*; but this does not appear certainly to be right: the several species of *colutea* agree as well with this description as the *jena*, and they have indeed been called *jena* by many; probably it was one of these.

PEPLOUD, in *Geography*, a town of Hindoostan, in the Candeish country; 80 miles S. of Indore. N. lat. 21° 42'. E. long. 76 45'.

PEPLUS, *πεπλος*, among the ancients, a kind of garment worn by women.

The peplus was a long robe that reached to the feet, without any sleeves, and so exceeding fine, that the shape of the body could easily be discovered through it.

The peplus of Minerva is very famous among ancient mythologists. The Athenians used a great deal of ceremony in making the peplus, and dressing the statue of the goddess with it.

The peplus was worked over with gold, on which were represented the combats and grand achievements of Minerva, Jupiter, and the Hermes. On the feast of the *Panathenæa*, (which see.) this was carried about in procession, formed of persons of all sexes, ages, and ranks; the young bringing up the rear, and the aged bearing an olive branch in their hands, the young virgins baskets, and the blooming boys

crowned with millets, and singing hymns known by the name of “*Pæans*,” while those who were called “*Rhapsodists*” recited verses of Homer. The procession advanced from the Ceramicus to the temple of Ceres Eleusina. The peplus was fastened to a barge, which was moved along by machinery.

PEPLUS, in *Botany*, *πεπλος* of Dioscorides, appears by his description to be some kind of Spurge, or *Euphorbia*. Linnæus believed it the common European weed, which he denominated, for that reason, *E. Peplus*. Dr. Sibthorp was induced to think the *E. falcata* of Linnæus was rather the plant of Dioscorides; not only “because it is frequent in vineyards and other cultivated ground, in Greece and the Greek islands; but because the procumbent mode of growth of this species, and the thick bush it forms, answer much better to the description of that ancient author, than the more upright growth of *E. Peplus*.”

PEPO, a Gourd or Pumpkin. See CUCURBITA.

PEPO, in *Vegetable Physiology*, is adopted, as a technical term, by Gærtner and Willdenow, for a particular kind of succulent fruit, exemplified in the natural order of *Cucurbitaceæ*, in which the seeds are attached to the inner surface of the rind. This sort of fruit differs, in different plants, with respect to the thickness or hardness of the rind, and the more or less pulpy nature of the internal substance, as well as the number of cells into which that substance, at an early period, is usually divided. The writer of this article, as well as Gærtner, considers the *Pepo* as no other than one of the numerous forms of a *Bacca*, the insertion of the seeds differing in no respect from those of a Gooseberry. Willdenow alone has described it as a distinct kind of fruit, ranging after the *Pomum*, or Apple, with which Linnæus has, very unaccountably, confounded it, in his generic descriptions of *Trichosanthes*, *Momordica*, *Cucurbita*, and *Cucumis*.

PEPPER, or *Lizard's Tail*, in *Botany*. See PIPER.

PEPPER, *Black*, *Piper nigrum*, is an aromatic fruit, obtained from a species of piper, which grows spontaneously in the East Indies, but does not arrive at perfection without the aid of culture. It is cultivated with such success at Malacca, Java, and especially at Sumatra, that from these islands pepper is exported to every part of the world, where a regular commerce has been established. According to Mr. Marsden, (Hist. of Sumatra,) the ground chosen by the Sumatrans for a pepper garden, is marked out into regular squares of six feet, the intended distance of the plants, of which there are usually a thousand in each garden. The next business is to plant the chinkareens, which serve as props to the pepper vines, and are cuttings of a tree of that name, which is of quick growth. When the chinkareen has been some months planted, the most promising perpendicular shoot is reserved for growth, and the others lopped off; this shoot, after it has acquired two fathoms in height, is decapitated sufficiently high, and its top is cut off. Two pepper vines are usually planted to one chinkareen, round which the vines twirl for support; and after being suffered to grow three years (by which time they acquire eight or twelve feet in height) they are cut off about three feet from the ground, and being loosened from the prop, are bent into the earth in such a manner that the upper end is returned to the root. This operation gives fresh vigour to the plants, and they bear fruit plentifully the ensuing season. The fruit, which is produced in long spikes, is four or five months in coming to maturity: the berries are at first green, turn to a bright red when ripe and in perfection, and soon fall off if not gathered in proper time. As the whole cluster does not ripen at the same time, part of the berries would be left in waiting

for

PEPPER.

for the latter ones; the Sumatrans therefore pluck the bunches as soon as any of the berries ripen, and spread them to dry upon mats, or upon the ground. By drying they become black, and more or less shrivelled, according to their degree of maturity. These are imported here under the name of *black pepper*.

Pepper is also cultivated to a considerable extent in India. Dr. Roxburgh began the cultivation of black pepper in the circars in 1787; using for prop trees the Moechy woodtree, or *Erythrina corallodendron*. One thousand plants yield from 500lbs. to 1000lbs. of pepper.

PEPPER, *White, Piper album*, is the fruit of the same plant with the black, though some have erroneously thought it to be a different species. Accordingly it has been sold at the sales of the East India company, who have the monopoly of the Sumatran pepper trade, for treble the price of the black. Whereas white pepper is the ripe and perfect berries of the same species stripped of their outer coats. For this purpose the berries are steeped for about a fortnight in water, till by swelling their outer coverings burst; after which they are easily separated, and the pepper is carefully dried by exposure to the sun. Or, the berries are freed from their outer coats by means of a preparation of lime and mustard oil, called "Chinam," applied before it is dried. Pepper which has fallen to the ground over-ripe loses its outer coat, and is sold as an inferior sort of white pepper.

Of these pungent hot spices the black sort is the hottest and strongest, and most commonly made use of for medicinal as well as culinary purposes. Its virtues are entirely extracted by ether and alcohol, and partially by water. The aqueous infusion has a brown colour, and reddens vegetable blues; and the decoction of the ground pepper forms a precipitate with infusion of galls, which dissolves again when the fluid is heated to 120°. When the alcoholic infusion is distilled, a green, resinous, oily matter is left, which appears to be the source of the odour and taste of the pepper. Its principal constituents are supposed to be starch, the above oily matter, and extractive. Ether digested on powdered pepper takes up three parts in ten; and when evaporated on water, deposits an intensely hot, biting, yellowish resin, with the odour of the pepper, and an almost insipid extractive matter. It has been said, that these spices differ from most others in this, that their pungency resides not in the volatile parts, or essential oil, but in a substance of a more fixed kind, which does not rise in the heat of boiling water; and that this fixed substance is probably the resinous part; the aromatic odorous matter seeming to depend upon the essential oil. The distilled oil has a strong smell of the pepper, with little acrimony; the remaining decoction, inspissated, yields an extract of considerable pungency. The quantity of extract from both kinds of pepper is nearly the same; that by rectified spirit amounting to about one-eighth, and the watery to nearly one-half their weight; but those of the white are weaker than the other sort. A tincture made in rectified spirit is extremely hot and fiery; a few drops of it set the mouth, as it were, in a flame.

Black pepper is stimulant and carminative: its use as a condiment is well known, and though, in general, it is not hurtful, but is useful to those whose digestion is weak, yet, even in small quantities, it proves injurious, where the inflammatory diathesis is present, and to those who are subject to piles. Some have supposed pepper to be less heating to the system than other aromatics; and Gaubius asserts that, when taken in large quantities, he never found it to warm his stomach, nor to increase the frequency of his pulse. Whereas Dr. Cullen affirms, that when he took this spice, even in a small quantity, it felt warm in his stomach, and

heated his whole body; and he supposes, that Gaubius did not feel its effects from the frequent use of it. As a medicine, pepper is sometimes found serviceable in checking nausea and vomiting, and removing hiccough. It has been also successfully employed in some cases of vertigo, and in paralytic and arthritic disorders. In large doses it has been found a remedy for intermittents; but such use of it has, in some instances, produced fatal consequences. The watery infusion forms an useful gargle in relaxation of the uvula. The dose of black pepper may be from \times gr. to \mathcal{J} j. The officinal preparations are the "Emplastrum melces vesicatorii compositum" of Edinb., and the "Unguentum piperis nigri" of Dubl. Woodville. Thomson.

Pepper that is sold ground is very apt to be sophisticated; the black with burnt crust of bread, &c., and the white with beaten rice.

PEPPER, *Long, Piper longum*, is thus denominated from its form, which is cylindrical, and about an inch and a half in length; it consists of an assemblage of grains, or seeds, joined close to one another, of a brownish colour, bordering without on red, and within on black; and grows by a long pedicle to a plant, like that of the black pepper, and of the same genus, but lower, and its leaves smaller and greener. It is a native of the East Indies, especially Java, Malabar, and Bengal. The berries, or grains, are very small, and lodged in a pulpy matter; like those of the black pepper, they are first green, and become red when ripe. This fruit is hottest to the taste in its immature state, and is therefore gathered while green, and dried by the heat of the sun, when it changes to a blackish or dark grey colour. Dr. Cullen observes, that long pepper has precisely the same qualities with those of black, but in a weaker degree; and Bergius says that black pepper is hotter than this species, whereas the contrary is the fact, and is asserted both by Lewis and Murray. Its constituent parts appear to be similar to those of black pepper. Ether digested on powdered long pepper takes up $2\frac{1}{2}$ parts in 10, and when evaporated on water deposits a resin less hot than that of black pepper, but more permanent; and a smaller proportion of extractive. Its officinal preparations are "Confectio opii" Lond., "Pulvis cinnamomia comp." L. D., "Pulvis cretæ comp." L., and "Tinctura cinnamomi composita," L. E. D. Woodville. Thomson.

Some have mentioned three kinds of this pepper, that of the East Indies, that of America, and that of Ethiopia, called also grain of Zelim; though the first alone is the proper long pepper, the rest resembling it but little.

PEPPER, *Barbary, Bell, Bird, Bonnet, and Cayenne*. See CAPSICUM.

PEPPER, *Guinea, piper Indicum*, obtained from a species of the capsicum, is a reddish pod, of a coral colour, much esteemed by the Americans, from among whom it is brought, and by them called *chile*, and by the French, *garden coral*. See CAPSICUM.

Under the article CAPSICUM we have mentioned the dietetic and medicinal use of the fruit of the capsicum, or of Cayenne pepper. We shall here add some other particulars. It has been found beneficial in lethargic affections; in dropsies, and other cachectic complaints, when chalybeates are indicated, a small portion of powdered capsicum is recommended as an excellent addition by Dr. Wright; and in the diseases cynanche maligna, and scarlatina maligna, it has been found highly useful, both given internally, and used as a gargle. Cataplasms of capsicum operate as a powerful rubefacient without blistering the skin, and are used in the West Indies to relieve the coma and delirium, which almost constantly attend tropical fevers. The diluted juice of the fruit is said

to be a sovereign remedy in ophthalmia from relaxation. Capsicum may be given in the form of pills in doses from grs. vj to grs. x; or fʒj to fʒij, in a glass of water, of a tincture made with ʒiv of capsicum and fʒviij of alcohol. The gargle usually employed is made by beating into a paste ʒj of Cayenne pepper and ʒj of common salt; then adding fʒvj of boiling water; and to the solution, strained when cold, fʒiv of vinegar. But a simple infusion in the proportion of gr. j of the pepper to fʒj of boiling water, answers equally well. Thomson.

PEPPER, *Jamaica*, called by the Dutch *amoni*, by the Spaniards *pimenta de Jamaica*, is the fruit of a tree, the *myrtus foliis alternis* of Linnæus, growing plentifully in Jamaica, and other American islands.

It is a real aromatic, and may supply the defect of cloves, nutmeg, and cinnamon; whence it is called also by the English, *all-spice*. The French call it the *round clove*, from its round shape, and its taste resembling that spice. See MYRTUS and PIMENTA.

PEPPER, *Ciapa*, *pimenta de Ciapa*, a name given by the Spaniards to a sort of spice which they discovered in Ciapa, a province of Guatemala, in New Spain, and of which they were at first very fond, both in food and medicine.

In medicine it is a very good cephalic and stomachic. It is recommended very strongly also by some of the Spanish writers, as a cure for the epilepsy and gutta serena; but those who tried it in these cases do not confirm such accounts.

The descriptions we have of it are, that it has the taste of cloves, pepper, cinnamon, and ginger, all blended together; and Redi is of opinion, that it is no other than our pimenta, or Jamaica pepper.

PEPPER, *Indian*. See GUINEA PEPPER and CAPSICUM.

PEPPER, *Poor man's*, a name sometimes given to the *ditander*, or *lepidium*; which see.

PEPPER, *Wall*, a name sometimes given to a species of sedum, or lesser house-leek. See SEDUM.

PEPPER, *Water*, a species of *polygonum*; which see. Miller and others make it a species of the *persicaria*; which see.

PEPPER *grafs*. See PILULARIA.

PEPPER *mint*, the name of a species of mint. See MENTHA.

PEPPER *wort*, a name by which some call the *lepidium*; which see.

PEPPER *bird*, in *Ornithology*, the English name of the rhamphastos with a yellow rump, otherwise called *toucan*.

PEPPER *mushroom*, in *Botany*, a name given by Dr. Lister to a new species of fungus, discovered by him in the woods of Yorkshire, whose juice is acrid and hot as pepper. This is somewhat larger than the common esculent mushroom, but of the same shape with that, having a round head and open gills underneath. The head is very fleshy, and the pedicle also is solid, not hollow, as in most other of the large funguses: any part of this mushroom being cut or broken, it bleeds very freely a white milky juice, like that of the thymals. This juice tastes like pepper, only that it is much hotter. It is not viscid or clammy to the touch, and the air does not much discolour it; nor does it render the blade of the knife, with which it is cut, black, as most other vegetable juices do. When let out of the plant it very soon concretes into a firm and dry mass, making a sort of cake; and when thus dried into a solid substance, it retains its white colour and pungent taste. It is very remarkable, that this mushroom, though so hot to our tongues as not to be endured, yet is so well suited to the palates and nature of certain insects, that they can not only feed on it, but live comfortably in the midst of it. The yellow naked snail feeds

greedily on the plant while growing, and the stalks of it at such times as the juice is sharpest of all, that is, while it is growing to the full size, are full of the maggots and worms hatched from the eggs of flies, deposited there for a nidus and food for them in that state. The juice has a great affinity with euphorbium, and may be brought into medicinal use, perhaps, to very good purpose.

John Bauhine describes a mushroom much resembling this, but smaller and less fleshy; and the Prussians and Polanders have a sort of great mushroom, which they call *groozdijbys*, which agrees with this in many particulars; but it is larger and thicker. Phil. Transf. N^o 89.

PEPPER *water*, a liquor prepared by the curious for examination by the microscope, as always affording a great number of small animals.

The method of preparing it is this: put common black pepper, grossly powdered, into an open vessel, so as to cover the bottom of it half an inch thick, and put to it rain or river water, till it covers it an inch; shake or stir the whole well together, at first mixing, but never disturb it afterwards: let the vessel be exposed to the air, uncovered; and in a few days there will be seen a pellicle or thin skin swimming on the surface of the liquor, appearing of several colours.

This is a congeries of multitudes of small animals; and being examined by the microscope, will be seen all in motion: the animals, at first sight, are so small as not to be distinguishable, unless to the greatest magnifiers; but they grow daily till they arrive at their full size. Their numbers are also continually increasing, till the whole surface of the liquor is full of them, to a considerable depth. When disturbed, they will sometimes all dart down to the bottom, but they soon after come up to the surface again. The skin appears soonest in warm weather, and the animals grow the quickest; but in the severest cold it will succeed, unless the water freezes. Baker's Microscope, p. 71.

About the quantity of a pin's head of this scum, taken upon the nib of a new pen, or the tip of a hair-pencil, is to be laid on a plate of clear glass; and if first applied to the third magnifier, then to a second, and finally to the first, will shew the different animalcules it contains, of several kinds and shapes, as well as sizes. Phil. Transf. N^o 284.

The animalcules discoverable in this liquor are principally of six kinds. 1. The largest kind of all is in length about the diameter of a hair, and scarcely a fourth part of that measure in breadth; they are very thin and transparent, but their back is darker than their belly; they turn about very frequently and nimbly in the water: their sides are fringed with a great number of minute feet, which are seen principally at the two ends; and at one end there are also some bristles longer than the feet, which make a sort of tail. They are very nimble, and walk as well as swim, and will climb up a hair, if put in among them.

2. There is a smaller sort, whose length is about the third of a hair's breadth; but their tail is five or six times as long as their body. This they either carry straight, or in a spiral form; and at the other end they thrust out a sort of bearded tongue: these make a constant current of water towards them.

3. There is a smaller sort than these, which are sometimes seen of an oval figure, and sometimes long and flat, like a flounder: these also have feet, which are plainly seen when the water is evaporating.

4. A fourth may appear like slender worms, fifty times as long as broad: their thickness is not above the hundredth part of a hair's breadth; and they move with equal ease either forward or backward.

5. There is a fifth sort extremely minute and round; and 6. A sixth kind, which are longer than these, but not larger; and probably there may be yet many kinds not discovered. These small animals are easily destroyed; a little dissolved salt or fugar, or spirit of vitriol, or even spittle, will kill them; and in the drying away of the waters many of them burst. Phil. Trans. N^o 203.

PEPPER Bay, in *Geography*, a bay on the W. coast of the island of Java; 30 miles S.S.W. of Bantam. S. lat. 6 24'. E. long. 105 40'.

PEPPERBERG, a town of the island of Java, on the S. coast; 75 miles S. of Batavia.

PEPPERELBOROUGH, a township of America, in York county, and state of Maine, on the N. side of Saco river, near the mouth, which separates it from Biddeford to the south. A bank by the name of "Saco Bank" was established here in 1803; about 12 miles S.W. of Portland. It was incorporated in 1772, and contains 1842 inhabitants.

PEPPERELL, a township of Massachusetts, on the E. branch of Nashaway river, and on the N. line of Middlesex county; 40 miles N. by W. of Boston; incorporated in 1753, and containing 1198 inhabitants.

PEPSQUIACH POINT lies on the northern side of Chaleur bay, now called "Paspibiac Point;" about three leagues W.N.W. of East Nouvelle. It is a barren plain, nearly a league long, where is carried on a very extensive fishery.

PEPTIC, in *Medicine*. See PEPASTIC.

PEPUNG, in *Geography*, two small islands of the East Indian sea, near the coast of China. N. lat. 23° 22'. E. long. 107°.

PEPUSCH, JOHN CHRISTOPHER, in *Biography*, doctor in music, Oxon., a very learned musician, who was born at Berlin in 1667, and had made so great a progress in music at the age of fourteen, that he was sent for to court, where he gave such proofs of his abilities that he was appointed to teach the prince, father of the late king of Prussia. He remained at Berlin till he was about twenty, when he went into Holland, where he first began to publish his compositions; but after continuing there about a year, he came to England soon after the Revolution. His first employment in London was playing the tenor in the band at Drury-lane play-house; but having convinced the managers that he deserved a better place, he was advanced to the harpsichord about 1700. In 1707 he had acquired English sufficient to adapt Motteaux's translation of the Italian opera of "Thomyris" to airs of Scarlatti and Bononcini, and to new-set the recitatives. In 1709 and 1710, several of his works were advertised in the first edition of the *Tatlers*, particularly a set of sonatas for a flute and base, and his first book of cantatas. In 1713 he obtained, at the same time as Crofts, the degree of doctor of music at the university of Oxford. And soon after this, upon the establishment of a choral chapel at Cannons, he was employed by the duke of Chandos as maestro di capella; in which capacity he composed anthems and morning and evening services, which are still preserved in the Academy of Ancient Music. In 1715 he composed the masque of "Venus and Adonis," written by Cibber; and in 1716 "The Death of Dido," by Booth, both for Drury-lane. These pieces, though not very successful, were more frequently performed than any of his original dramatic compositions. In 1723 he published an ode for St. Cecilia's day, which he had set for the concert in York-buildings. And about the year 1724, Dr. Berkeley, dean of Londonderry, afterwards bishop of Cloyne, having formed a plan for erecting a college in one of the Summer isles, or Bermudas, among the several persons of

VOL. XXVI.

distinguished abilities whom he had engaged to accompany him thither, fixed on Dr. Pepusch. But having embarked with his associates for the intended settlement, the ship was wrecked, and the undertaking frustrated.

Being returned to England after this accident, Dr. Pepusch married Margarita de l'Epine, who had quitted the stage, where she had acquired a fortune that was estimated at 10,000*l*. These possessions, however, did not incline the doctor to relax in his musical studies or pursuits. He had always been a diligent collector of ancient music and musical tracts, and he was now enabled to gratify this passion without imprudence. He still continued to compose for the play-house in Lincoln's-Inn-Fields, and had the "Squire of Alsatia" for his benefit there in 1726, "with singing by Mrs. Chambers, also singing in Italian and English by Mrs. Forsyth, Mrs. Davies, and Mrs. Grimaldi, being the first time of their respective appearances on the stage." Soon after he was very judiciously chosen by Gay, to help him to select the tunes for the "Beggar's Opera," for which he composed an original overture upon the subject of one of the tunes (I'm like a skiff), and furnished the wild, rude, and often vulgar melodies, with bases so simple and excellent, that no judicious contrapuntist will ever attempt to alter them for the theatrical purpose for which they were originally designed. It would be easy to multiply notes, and make the base more important than the treble, at the expence of the singer, the vocal part, and of propriety; and we will venture to say that the instrument or accompaniment that robs the singer of the attention of the audience by being too loud, or too busy (if the singer is worth hearing), is much more deserving of censure than praise.

After this period, he composed but little, applying himself chiefly to the theory of music, and explaining the mysteries of composition to young professors. He had always been extremely anxious for the prosperity of the Academy of Ancient Music, of which he was one of the first founders, and continued very active in its service to the time of his death. As a consequence of his musical erudition and zeal for the advancement of his art, he published, in 1731, a correct edition of a short "Treatise on Harmony," which the late earl of Abercorn is supposed to have assisted him in putting into English. This nobleman had so long studied composition under Dr. Pepusch, and so frequently conversed with him on the subject, that he was supposed more able to explain his principles in English than the doctor himself. The first edition of this small tract appeared without the plates or the consent of the author. This work contains many elementary rules for composition that are practical and useful; but it likewise contains many prejudices and exploded doctrines, which, to revive, would shackle genius and throw the art back into Gothic times.

In 1737 he was appointed organist of the Charter-house, which afforded him a tranquil retreat well suited to his time of life and love of study; and he was visited and consulted as an oracle, not only by young musical students, to whom he was always kind and communicative, but by every master who modestly supposed he had still something to learn. Here he greatly augmented his library, which consisted of musical curiosities, theoretical and practical, of all kinds.

In 1739 he lost a son, his only child, upon whose genius and disposition there was every reason to found the greatest expectations; and in 1740 Mrs Pepusch died; after which, his time seems to have been chiefly devoted to the study of the genera and systems of the ancient Greek music, concerning which he presented a paper to the Royal Society in

1746, N^o 481, and Martin's Abridg. vol. x. and was soon after elected a member of that learned body.

From this period till the year 1752, when he died at the age of eighty-five, he persisted in the study of Greek music; and having dispatched the "Genera," was trying to illustrate the doctrines and prejudices of Isaac Vossius concerning the "Rhythmus" of the ancients, but left no papers behind him on the subject, that were either useful or intelligible to those who had the possession of them after his decease.

This profound musician was buried in the chapel of the Charter-house, where a tablet was placed, and inscribed to his memory, by his friends and associates of the Academy of Ancient Music.

As a practical musician, though so excellent a harmonist, he was possessed of so little invention, that few of his compositions were ever in general use and favour, except one of his twelve cantatas, "Alexis," and his airs for two flutes or violins, consisting of simple easy themes or grounds with variations, each part echoing the other in common divisions for the improvement of the hand. Indeed, though only one cantata of the two books he published was ever much noticed, there is considerable harmonical merit in them all; the recitatives are in general good, and the counterpoint perfectly correct and masterly. The fifth cantata of the second book seems much superior to the rest: the first air would admit of modern taste and expression, the harmony is rich, and the parts are well arranged; and the second air, with a trumpet accompaniment, is spirited, and if sung by a powerful and cultivated voice, would have a good effect. But these cantatas are by no means in the style of Alef. Scarlatti, as has been suggested; they rather resemble the cantatas of Gasparini, whose melodies were simple and modulation timid, than the original cantilena and extraneous modulation of Scarlatti. Among all the publications of Pepusch, the most useful to musical students was, perhaps, his correct edition of Corelli's sonatas and concertos in score, published in 1732.

He treated all other music in which there was fancy or invention with sovereign contempt. Nor is it true, as has been asserted, that "he readily acquiesced in Handel's superior merit." Handel despised the pedantry of Pepusch, and Pepusch, in return, constantly refused to join in the general chorus of Handel's praise.

The sole ambition of Pepusch, during the last years of his life, seems to have been the obtaining the reputation of a profound theorist, perfectly skilled in the music of the ancients; and attaching himself to the mathematician De Moivre and Geo. Lewis Scot, who helped him to calculate ratios, and to construe the Greek writers on music, he bewildered himself and some of his scholars with the Greek genera, scales, diagrams, geometrical, arithmetical, and harmonical proportions, surd quantities, apotomes, lemmas, and every thing concerning ancient harmonics, that was dark, unintelligible, and foreign to common and useful practice. But with all his pedantry and ideal admiration of the music of the ancients, he certainly had read more books on the theory of modern music, and examined more curious compositions, than any of the musicians of his time; and though totally devoid of fancy and invention, he was able to correct the productions of his contemporaries, and to assign reasons for whatever had been done by the greatest masters who preceded him. But when he is called the most learned musician of his time, it should be said, in the music of the 16th century. Indeed, he had at last such a partiality for musical mysteries, and a spirit so truly antiquarian, that he allowed no composition to be music but what was old and

obscure. Yet, though he fettered the genius of his scholars by antiquated rules, he knew the mechanical laws of harmony so well, that in glancing his eye over a score, he could by a stroke of his pen smooth the wildest and most incoherent notes into melody, and make them submissive to harmony; instantly seeing the superfluous or deficient notes, and suggesting a base from which there was no appeal.

His admirable library, the most curious and complete in scarce musical authors, theoretical and practical, was dispersed after his death. He bequeathed a considerable part of his best books and manuscripts to Kelner, an old German friend, who played the double-bass in the theatres and concerts of the time; some to Travers, and these and the rest were at last sold, dispersed, and embezzled, in a manner difficult to describe or understand. For an analysis of Dr. Pepusch's "Treatise on Harmony," see COUNTER-POINT.

There never was a great man in any art or science who had not his opponents: and there have always been two opinions concerning the merit of Pepusch. He was respected and revered by the exclusive lovers of old music, and students in harmony; while the admirers of Handel, and of modern Italian composition, regarded him as a pedant totally devoid of genius. It seemed, therefore, but just and equitable, after the decease of his friends and his foes, to point out, with the utmost truth and candour, the real merit and deficiencies in this little valuable work.

PEPUZA, in *Ancient Geography*, a town of Asia, in Phrygia Pacatiana.

PEPUZIAN, in *Ecclesiastical History*, a sect of ancient heretics; otherwise called Phrygians, or Cataphrygians.

They had their name Pepuzians, from a pretence that Jesus Christ appeared to one of their prophetesses in the city of Pepuza in Phrygia, which was their holy city. See QUINTILIANS.

PEPLYCHNUS, in *Ancient Geography*, a river which bounded Macedonia.

PEPYS'S ISLANDS, in *Geography*. See FALKLAND ISLANDS.

PEQUANACK, a township of America, in Morris county, New Jersey, separated from Bergen county N. by Pegunock river.

PEQUANNOCK Point or River. The river is a small stream which runs S. through the towns of Huntington and Stratford in Fairfield county, Connecticut, and discharges itself into a bay in the sound, where vessels may anchor. The point forms the western extremity of the bay, near which are some rocks; 5 miles S.W. of Stratford river.

PEQUEA CREEK, a river of Pennsylvania, which runs into the Susquehanna, N. lat. 39 54'. W. long. 76 22'.

PEQUESIGHAUGEM, or BEAR Lake, the source of a river of the same name, which is the north-easterly branch of Maggakadawa river: it is of an irregular form, about three miles long, and two wide.

PEQUEST CREEK, a river of New Jersey, which runs into the Delaware, N. lat. 40 47'. W. long. 75 10'.

PER, a Latin preposition often used before the two words *Arsis* and *Thesis*. *Per thesin* means, in beating time, the first note or portion of a bar, when the hand or foot is beaten down. *Per arsin* implies the second or fourth portion of a bar, when the hand or foot is lifted up. It is also said of a melody, counterpoint, or fugue, &c. that the notes move *per thesin*, when they descend from the acute to the grave; and that their motion is *per arsin*, when, on the contrary, the notes mount from the grave to the acute.

PER is also an Italian preposition which has many acceptations in the musical compositions of Italy.

1. Before the name of authors, when it is meant to signify *by* in English; but this is bad Italian.

2. It is constantly found in tables of contents to motets, indicating the occasion, the subject, and day of festivals, on which it was intended to be sung: and then it means *for*. *Per la Beata Virgine*, or the initials B. M. Y. for, or in honour of, the blessed Virgin. *Per li*, or *gli defuncti*; for the dead, &c.

3. *Per* also often signifies *A*, or *per diritto*, straight on. *Per rovescio*, by inversion, &c.

PER *Accidens*. See **ACCIDENS**.

PERA, in *Botany*. See **PERULA**.

PERA, in *Ancient Geography*, a place near mount Hymettus in Attica; where was a temple of Venus, with a fountain, which procured a happy delivery for the females who drank of it, according to the relation of Suidas.

PERA, in *Geography*, a suburb of Constantinople, in which the ambassadors, the agents of foreign courts, and almost all foreigners reside, with the exception of the merchants who are established at Galata, another suburb, being that nearer to the harbour, and more conveniently situated for their commercial affairs. Pera is one of the most populous quarters of the city, notwithstanding its distance from the port and the centre of business; and the lodgings are extremely dear, since the rich Armenians came to settle there, in order to be less exposed to exactions and the insults of the Turks, and to enjoy a little more liberty under the protection of the Europeans. See **CONSTANTINOPLE**.

PERA, a town of Portugal, in Algarva; 8 miles E. of Villa Nova de Portimao.—Also, a sea-port and capital of a kingdom, on the W. coast of Malacca, on a river of the same name; 170 miles N.W. of Malacca. N. lat. $4^{\circ} 23'$. E. long. $101^{\circ} 15'$.

PERA, or *Pulo Pera*, a small island in the East Indian sea, at the entrance of the straits of Malacca. N. lat. $5^{\circ} 54'$. E. long. $98^{\circ} 36'$.

PERACUTUM MENSTRUUM. See **MENSTRUUM**.

PERÆA, in *Ancient Geography*, a province of Asia Minor, which commenced on the frontiers of the Doride, towards mount Phœnix, N.E. of the isle of Rhodes, and terminated at Dædala. The first writer who mentions this province is Polybius. It was for a long time subject to the Rhodians, and a town called Cryassus was situated in it.—Also, a country on the other side of Jordan, which was one of the divisions of Palestine. According to Josephus, in his "Wars of the Jews," Peræa had for its limits on the E. Rabba or Philadelphia, on the W. the Jordan, on the S. Macherontes, and on the N. Pella.—Also, a small country of Asia, on the banks of the Tigris.—Also, a canton of Greece, in the territory of Corinth, the inhabitants of which were called "Peræi."

PERÆQUATOIRES, among the Romans, assessors appointed to regulate the census according to every man's circumstances, by easing those that were overcharged, and raising the taxation if too low.

PERÆTHUS, in *Ancient Geography*, a town of the Peloponnesus, in Arcadia. Pausanias says, that among the ruins of this town, there was visible a temple of the god Pan.

PERAFTA, in *Geography*, a town of Spain, in Catalonia; 10 miles N.N.W. of Vique.

PERALADA, a town of Spain, in Catalonia; 22 miles N.N.E. of Gerona.

PERALES, a town of Portugal, on the left bank of the Tagus, opposite to Abrantes.

PERALTA, a town of Spain, in Navarre, celebrated for its wine; seven miles S.S.W. of Olite.

PERAM, a small island in the gulf of Cambay. N. lat. $21^{\circ} 30'$. E. long. $72^{\circ} 3'$.

PERAMA, in *Botany*. See **MATTUSCHIKÆA**.

PERAMBULATION of the Forest, the surveying, or walking about a forest, or the limits of it, by justices or other officers appointed for this purpose, to set down the metes and bounds thereof, and what is within the forest, and what without.

PERAMBULATION of Parishes is annually performed in order to preserve those bounds of parishes, which have been long settled by custom; and because these perambulations were performed in the rogation week, the rogation days were anciently called *gange-days*, from the Saxon *gan*, or *gangen*, to go.

In the perambulation of a parish, no refreshments can be claimed by the parishioners, as due of right from any houses or lands in virtue of custom.

These perambulations were, in the times of popery, accompanied with great abuses, *viz.* with feasting and superstition; being performed in the nature of processions, with banners, hand-bells, lights, staying at crosses, and the like: and, therefore, when processions were forbidden, in the reign of queen Elizabeth, it was required, that, for the retaining of the perambulations of the circuits of parishes, the people should, once a-year, at the usual time, with the curate and the substantial men of the parish, walk about the parishes, and at their return to church make their common prayers, &c.

PERAMBULATIONE FACIENDO, is a writ commanding the sheriff to make perambulation, and set down the bounds of two or more manors, whose limits are not so well known.

The writ de perambulatione faciendi is only issued, where the lords of both manors agree to have such perambulation. If one of them refuse, the other must seek his remedy by a writ de rationabilibus divisis.

PERAMBULATOR, in *Surveying*, an instrument for the measuring of distances; called also *pedometer*, *way-wifer*, and *surveying-wheel*.

Its advantages are its handiness and expedition: its contrivance is such, that it may be fitted to the wheel of a coach; in which state it performs its office, and measures the road without any trouble at all.

There is some difference in its make; that now most usual, and most convenient, is as follows.

PERAMBULATOR, or Way-wifer, construction of the. The perambulator (represented *Plate VI. Surveying, fig. 9.*) consists of a wheel two feet seven inches and a half in diameter; consequently half a pole, or eight feet and three inches in circumference. On one end of the axis is a nut, three quarters of an inch in diameter, divided into eight teeth, which, upon moving the wheel round, fall into the eight teeth of another nut *c*, fixed on one end of an iron rod *Q*, and thus turn the rod once round, in the time the wheel makes one revolution. This rod lying along a groove, in the side of a carriage of the instrument, has at its other end a square hole, into which fits the end *b* of the little cylinder *P*. This cylinder is disposed under the dial-plate of a movement, at the end of the carriage *B*, in such manner as to be moveable about its axis. Its end *a* is cut into a perpetual screw; which falling into the thirty-two teeth of a wheel perpendicular to it, upon driving the instrument forward, that wheel makes a revolution, each sixteen poles. On the axis of this wheel is a pinion with six teeth, which, falling into

the teeth of another wheel of sixty teeth, carries it round every hundred and sixtieth pole, or half a mile.

This last wheel then carrying a hand or index round with it, over the divisions of the dial-plate, whose outer limb is divided into one hundred and sixty parts, corresponding to the one hundred and sixty poles, points out the number of poles passed over. Again, on the axis of this last wheel is a pinion containing twenty teeth, which, falling into the teeth of a third wheel, that has forty teeth, drives it once round in three hundred and twenty poles, or a mile. On the axis of this wheel is a pinion of twelve teeth, which, falling into the teeth of a fourth wheel, that has seventy-two teeth, drives it once round in twelve miles.

This fourth wheel carrying another index over the inner limb of the dial-plate, divided into twelve, for miles, and each mile subdivided into halves, quarters, and furlongs, serves to register the revolutions of the other hand, and to keep account of the half-miles and miles passed over, as far as twelve miles.

PERAMBULATOR, or *Way-wifer, use of the*. The application of this instrument is obvious from its construction. Its proper office is in the surveying of roads, and large distances, where a great deal of expedition, and not much accuracy, is required. It is evident, that driving it along, and observing the hands, has the same effect as dragging the chain, and taking account of the chains and links. See **CHAIN**.

Long distances, says major Rennell, may be accurately measured by a perambulator; and he says, that during the Bengal survey, he measured a meridian line of three degrees with this instrument; and found it to agree minutely with the observations of latitude. An allowance, however, was made for the irregularities of the ground, whenever they occurred.

PERAMES, in *Geography*, a town of America, in Bergen county, New Jersey, lying on the point of land formed by the branches of Saddle river, a N. branch of the Passaic; about 18 miles N. of Bergen.

PERAMI, a town of the island of Cuba; 25 miles S.E. of Villa del Principe.

PERANEMA, in *Ichthyology*, the name of a Brazilian fish, of the size of the perch, being ten or eleven fingers in length, and about three fingers broad in the broadest part.

Its mouth is large and round, and has no teeth, but several very rough and sharp prominences; its eyes are large, and it has one long fin running down the back, which is supported by rigid and prickly rays; its tail is not forked; its whole body is a silvery white, with a faint blush of red; its scales are extremely small, and of a triangular figure, and its belly is very white: it is a sea-fish, and is wholesome and well-tasted.

PERANITES, the name of a stone mentioned with many idle stories of its origin, by the writers of the middle ages.

It seems originally to have been only a corruption of the word *peantides*, a name by which the ancients seem to have called our *stalactites* or *dropstone*.

PERARALO, in *Geography*, a town of Italy, in the Cadornin; two miles S. of Cadora.

PERAROR, a town of Hindoostan, in the Carnatic; 10 miles S. of Tiagar.

PER ARSIN, and **THESIN**, in *Musical*. See **PER**, &c.

PERASEMAJOKI, in *Geography*, a town of Sweden, in the province of Wasa; 50 miles E.N.E. of Chrilline-stadt.

PERASHACOTTA, a town of Hindoostan; 13 miles W.N.W. of Coimbatore.

PERASTA, a town of Albania, on the Cattaro.—Also, a town of European Turkey, in Romania, on the coast of the sea of Marmora; 12 miles N.E. of Gallipoli.

PERASTORFF, a town of Austria; five miles S.S.W. of Ips.

PERAY, ST., a town of France, in the department of the Ardèche, and chief place of a canton, in the district of Tournon. The place contains 1652, and the canton 7492 inhabitants, on a territory of 165 kilometres, in 10 communes.

PERBIGA, a town of Hindoostan, in Bahar; 45 miles S.S.W. of Patna.

PERBUTPOUR, a town of Hindoostan, in Allahabad; 40 miles N.E. of Gazypour.

PERCA, the *Perch*, in *Ichthyology*, a genus of fishes of the order Thoracici, of which the generic character is, jaws unequal; teeth sharp, incurved; gill-covers scaly, of three laminae, the upper ferrate; gill-membrane seven-rayed; lateral line arched with the back; scales hard, rough; fins spinous; vent nearer the head than the tail. The name *perca* is of Greek origin, and is derived from the word *περκαος*, which signifies variegated with black or dusky spots; a character common to most of the species of this fish. About sixty species are enumerated in Gmelin's last edition of Linnæus; these are divided into three sections according as they have one dorsal fin or two.

A. *Dorsal Fins two, distinct.*

Species.

* **FLUVIATILIS**, or Common Perch. The second dorsal fin has sixteen soft rays; the eyes are large; the iris blueish, edged within with yellow; the nostrils are double, near the eyes, with four pores before them; the mouth is large; jaws nearly equal; teeth small, in the jaws and on the roof; the tongue is smooth and short; aperture of the gills large; dorsal fins violet, the first with spinous rays and a black spot at the end; pectoral reddish, the rest are red; the tail is a little forked. This well-known fish measures from eight or ten inches to nearly two feet in length. It inhabits the clear streams of Europe and Siberia; the back, and part of the sides, are of a deep green, with five broad black bars, which are sometimes dark green or blue, and very rarely wanting; belly white tinged with red; it swims with great swiftness at a certain height in the water. It is tenacious of life, and may be carried sixty miles in straw, and yet survive the journey; eagerly takes a bait: it feeds on aquatic insects and smaller fish, spawns in May and June, and is very prolific: it has no real air-bladder. Its flesh is firm and delicate, and was held in high repute at the table of the ancient Romans. In some of the northern countries, a sort of isinglass is made from the skin. It is preyed upon by the pike, eel, &c.

AMERICANUS. Red; second dorsal fin with thirteen rays. It is found in the brackish waters of North America; the lower lip, chin, gill-membrane, and upper edge of the covers red.

LUCIOPERCA. Second dorsal fin with twenty-three rays. This species inhabits the clear waters of Europe and northern Persia. It grows to four feet long; is very voracious, feeds on other fish, even of its own tribe; spawns in May, and is extremely prolific; the flesh is tender and good.

VOLGENSIS. Green-gold; second dorsal fin with twenty-three rays. It is found chiefly in the Volga and neighbour-

PERCA.

ing rivers, and is an intermediate species between the fluvial and the lucioperca.

ASPER. Yellowish, with three or four transverse bands; second dorsal fin with thirteen rays. This species inhabits the clear waters of southern Europe, is from six to eight inches long. The body above is blackish, but it is whitish beneath; it feeds on insects and worms; the flesh is delicious.

ZINGEL. Second dorsal fin with nineteen rays; the lower jaw is by much the shorter of the two. It is found in the rivers of Germany. It resembles the last, except that it is much larger; the head more pointed; the gape large; the colour less dusky, and the tail longer, truncate, and somewhat rounded.

* **LABRAX;** the Baffe. Second dorsal fin with fourteen rays; the back is dusky, tinged with blue; the belly is white. It inhabits Europe and Egypt. It sometimes grows to the weight of twelve or fourteen pounds; is strong, active, and voracious; the body is shaped like a salmon.

ALBURNUS. Dorsal fins unarmed; the gill-membrane is three-rayed; the tail entire. It inhabits Carolina: the body is oblong, with numerous oblique brown bands.

PUSILLA. Body oval, compressed, rough. It inhabits the Mediterranean, is only an inch and a half long; the body is of a reddish-silvery hue, covered with very minute prickles. The head is armed with prickles; the lower jaw a little longer, very rough beneath; the iris is white; the ventral fins with a strong spine, and serrate on the anterior edge.

LOPHAR. Silvery; ventral fins connected. It inhabits Constantinople; it is about the size and shape of a herring; the back is greenish-brown: it is thought by some naturalists not to be of the perca tribe.

ARABICA. Body silvery, with longitudinal black lines; tail with a golden spot, and black in the middle. It inhabits Arabia, the body is oblong-lanceolate, truncate, beneath without spots or lines; the scales are lax, broad, deciduous, denticulate, disposed in ten rows; it has sixteen or seventeen black lines on each side.

NILOTICA. Dorsal fins hardly distinct; tail entire. It is found in the river Nile, and also in the Caspian sea.

B. *Dorsal Fins single; Tail undivided.*

Species.

UNDULATA. Dorsal fins sub-united; body brown, waved, a brown spot at the pectoral fins. It inhabits Carolina, and is there called the croker. The anterior gill-covers have five short teeth; the tail is entire.

OCELLATA. Dorsal fins sub-united; tail with a black ocellate spot at the base. It inhabits Carolina, and is there called the baffe. The first ray of the dorsal fin very short, the first of the ventral is shorter and unarmed; the spot on the tail is encircled with white.

ARGUS. Silvery-blueish, with numerous ocellate brown spots. It grows to about a foot in length, and is reckoned a very beautiful fish. The spots on the body have white centres; those on the head, pectoral and ventral fins, are smaller and without white centres.

* **MARINA;** Sea Pearch. This species is red, with dusky lines on the sides; gill-covers with a black spot; it has fifteen dorsal spines. It is found in many parts of Europe, is about a foot long, and the flesh is very good. The head is large and deformed; the eyes are large; the teeth are small, numerous, and on the head and gill-covers are strong spines.

SCANDENS. The dorsal fin of this species has seventeen

spinous and eight soft rays; the scales are rough, with a whitish denticulate edge. It inhabits rivulets in Tranquebar; is about four inches long; has the very singular habit of crawling up trees, whence it takes its specific name, which it effects by means of the spines on the gill-covers, and spinous rays of the other fins. It is described in the Linnæan Transactions. The body is covered with a black slimy mucus; above it is of dusky-green, lighter on the sides, and beneath it is of a pale golden colour.

NOBILIS. Body silvery, with eight brown bands. It inhabits North America. The spinous rays of the dorsal fin are silvery at the sides.

POLYMNA. Body black, with three white bands. It inhabits South America and some parts of India. The middle band passes through the hind part of the dorsal fin.

MERRA. Body white, with numerous sub-hexagonal brown spots. It inhabits Japan, and is about a foot long. The lower jaw longer; posterior gill-cover spiny, tail rounded.

COTTOIDES. All the fins of the fish of this species are marked with two dotted lines. It is found in India.

PHILADELPHIA. The dorsal fin has a black spot in the middle; the scales and gill-covers are ciliate. It inhabits South America.

PALPEBROSA. The eyelids of this species are marked with a brown spot; the lateral line is curved. It is a small fish, and inhabits America.

ATRARIA. The body of this species is black, the fins are spotted with white. It is found in Carolina.

CHRYSOPTERA. The lower fins are yellow, spotted with brown. It inhabits Carolina. The gill-covers are very finely toothed; the lateral line is straight.

MEDITERRANEA. All the fins of this species, except the dorsal, are tawny; the pectoral is marked with a pectoral black spot. It inhabits the Mediterranean. The body is green, with dusky lines parallel with a lateral line on the upper part; those on the lower part are broader, and of a fine blue; about a span long; compressed, oblong.

VITTATA. The body with five white and brown transverse lines: there is a variety of this species, in which the lines are widened into bands; the first inhabits America; the second Japan. They are about eight inches long.

GUTTATA. Body sprinkled with bloody coloured dots. This and the next are natives of America.

PUNCTATA. Body dotted with blue.

SCRIBA. Pectoral and caudal fins yellow; the head with irregular zigzag marks.

GIGAS. Body clouded; gill-covers three-spined; eleven dorsal spines. It inhabits the Mediterranean, and is about three feet long. The body is oval, compressed at the sides, whitish-yellow, with dusky-brown waves.

ROGAA. Reddish-black; tail equal; fins black; gill-membrane dusky-red. It is found in divers parts of Arabia.

LUNARIA. Rusty black; pectoral fins black, behind yellow; dorsal and caudal behind of a palish hyaline. It inhabits Arabia, and is a good deal like the last.

TAUVINA. Body oblong linear, brown, with rusty black dots; the tail is rounded. It inhabits Arabia. The scales are small and denticulate.

FASCIATA. This is red, with broad whitish transverse bands. It inhabits the Red sea: is above a yard long, and the scales are small.

MINIATA. This species is scarlet, covered with blue dots; the tail is rounded; there are two varieties: 1. Brown, with ocellate blue spots. 2. Red, with blue dots. It inhabits

bits

bits Arabia, and feeds on fish; the scales are very small, round, striate; the flesh is very good.

SUMMARI. Of this species there are three varieties.

1. Tail rounded; body ashy-brown, covered with white spots.

2. Body blueish, with brown dots.

3. Whitish-ash, with yellowish-brown dots. These are natives of Arabia.

SINENSIS. Yellowish; tail oval; lower jaw shorter. It inhabits China, and resembles the *P. fluviatilis*, but is smaller.

C. Dorsal Fin single; Tail forked.

Species.

ASCENSIONIS. Above reddish, beneath whitish. It is found in Ascension isle. The body is narrower, covered with oblong narrow scales, denticulate on the fore-part.

LOUTI. Oblong-lanceolate, carmine, with pale violet dots; hind edge of all the fins yellow. It inhabits Arabia, and is about three feet long.

VENENOSA. Pectoral fins tipped with yellow; the tail is lunate; the body is marked with blood-red dots. It is a native of America, and suspected of being poisonous.

MELANURA. Tail black, edged with white; the body is marked with yellow lines. It inhabits America, as does the next.

SECTATRIX. Tail forked, red on the hind-part; the belly is of a pale yellow, with grey lines.

STIGMA. Dorsal fin filamentous; gill-covers banded. It is a native of India.

DIAGRANMA. The body of this fish is white, with longitudinal stripes; it has eleven dorsal spines. It inhabits India, in fresh waters; grows to ten inches long, and preys on smaller fishes.

STRIATA. The body of this species is striate. It inhabits North America, and differs from the *P. melanura*, chiefly in not having the tail black.

LINEATA. Dorsal fin filamentous; the body with five alternate white and brown lines.

* CERNUA, or Ruffe. The dorsal fin of this species is twenty-seven-rayed; the spines are fifteen. It inhabits the clear streams of Europe, and is from six to eight inches long; the body is round, mucous, sides yellowish, dirty-green, spotted with black, breast white, nape and back blackish; it feeds on lesser fishes, and is the prey of larger, and also of various aquatic birds; it is a very fertile fish, and spawns in March or April; the flesh is reckoned very good.

* NIGRA; Black Fish. The body of this is narrow, with small thin scales. It is found in Cornwall, and is a very indistinct species.

ACERRINA. The dorsal fin of this species has thirty-one rays and seventeen spines. It inhabits the Euxine sea, and the rivers running into it; it resembles, in its figure, colour, and habits, the *P. cernua*, but its head is longer.

SCHRÆTTER. Body with longitudinal black lines on each side. It is found in many parts of the south of Europe; the head is aculeate.

ARGENTEA. Nostrils tubular; a black spot on the spinous part of the dorsal fin. It inhabits America.

CABRILLA. Body marked with four longitudinal blood-red stripes. A variety of this species is varied with yellow and violet blotches. It inhabits the Mediterranean.

RADULA. Body with white dots disposed in lines. It is found in India.

FORMOSA; Squirrel Fish. Tail lunate; head marked with blue lines, and blotches. It inhabits Carolina. The gill-covers

are toothed; the anterior part of the dorsal fin abbreviate towards the hind part.

SACER. Body rose-coloured; secondary of the dorsal fin very long. It inhabits the Mediterranean, and is about a foot long. The posterior gill-cover ends in a spine; the tail is lunate.

LUNULATA. Reddish; tail with a black lunule at the base. It inhabits Sumatra.

AURATA. Whitish, with a longitudinal yellow stripe. It inhabits Sumatra, as does the next.

SUMATRENSIS. Body dark-silvery; fins longitudinally striate. It inhabits in shoals the coasts of Sumatra; it is about three inches long; scales small, denticulate, and dotted with brown. It is described in the Linnæan Transactions.

TRIFURCA. The tail is trifid; and the body has several blue bands. It inhabits Carolina, and is very finely variegated.

The common perch, or perca fluviatilis of Linnæus, is much admired as a firm and delicate fish; and the Dutch are particularly fond of it when made into a dish called *water-fouchy*.

Mr. Pennant mentions a singular variety of the perch, the back of which is quite hunched, and the lower part of the back bone, next the tail, strangely distorted; in colour and other respects it resembles the common kind. It is found in a lake called *Llyn Raithlyn*, in Merionethshire, and also in the Thames near Marlow.

The common perch affords good sport for the angler. The best time for their biting is, when the spring is over, and before the heats of summer come on. At this time they are very greedy, and the angler, with good management, may take at one standing all that are in the hole, be they ever so many.

The perch will bite all day long, if the weather be cloudy; but the best time is from eight to ten in the morning, and from three to six in the afternoon. The perch is very abtemious in winter, and will seldom bite in this season of the year; if he does at all, it is in the middle of the day: at which time indeed all fish bite best at that season. See FISHING.

PERCA *Amboinensis*, the name of a fresh water fish, somewhat resembling our perch, but differing in that it is of a brown colour, and has several blue lines under its snout, and some blueness in the adjoining fins, but its back and belly fins are green. It is caught in the lakes and rivers of fresh water, at Amboyna, and is a very delicately tasted fish. See SCORPENA *Volitans*.

PERCA *Rhomboides*. See SPARUS *Rhomboides*. See also SPARUS *Mormyrus*.

PERCEE, L'ISLE, in *Geography*, a small but remarkable island on the W. side of the gulf of St. Lawrence, being a perpendicular rock, pierced with two natural arches, through which the sea flows. One of these arches is large enough to admit a large boat to pass through it; 15 miles S. of Cape Gaspee.

PERCEIANA, in *Ancient Geography*, a town of Spain, in the route from the mouth of the river Anas to Emerita, according to the Itinerary of Antonine.

PERCEPIER, in *Botany*, a name attributed by Lobel, in his *Adversaria* 324, to the *Apbanes* of Linnæus, *Alchemilla arvensis*, Engl. Bot. t. 1011; see APHANES. From the manner in which Lobel is always quoted, it would seem that he considered the above name as English; but he merely declares the plant was very commonly used about Bristol for promoting the urinary secretion. Gerard says "our herbe women in Cheapside know it by the name of Parsley brake-stone."

stone." Lobel's word seems a French corruption of the latter, which expresses the appearance of the plant, and its reputed lithontriptic virtues. Pursley-Piert, its English appellation in Ray's Synopsis, is but a little further corruption, partly typographical, in the third edition. Bauhin, in his Pinax 153, has Perchepier Anglorum, and he explains it by *Saxifraga*, or Break-stone. One would suppose, that amid all this jumble of nomenclature, there might be some foundation for the reputed qualities of this plant. Ray says "it is believed violently and suddenly to promote urine, and to break down the calculus. It is eaten raw, as a salad, or preserved with salt, and a distilled water is extracted from it for the above purposes." All this we fear is illusive, and has certainly not been confirmed by experience. The herb in question is indeed slightly astringent, and more slightly mucilaginous; qualities useful in the disease alluded to. But we cannot help suspecting it came into use, in times of ignorance, from its partial resemblance to some of those various diminutive herbs, that have obtained the name of *Saxifraga*, Saxifrage or Break-stone, from their growing on stones or walls, which their roots, by the force of vegetation, penetrate and break down. Hence such herbs were presumed likely to have an effect on the stone in the bladder; for if the old writers do not expressly declare this, the manner in which they speak of the quality of the plants, and of their places of growth, tacitly implies such an opinion. By tracing these hypothetical properties of plants to their sources, the *Materia Medica* is disencumbered from much trash, and implicit faith in the assertions of herbalists is considerably weakened. Perhaps we may be able to discuss the subject to a greater extent hereafter, in treating of the VIRTUES OF PLANTS.

PERCEPTION, PERCEPTIO, in *Logic*, the act of *perceiving*, or apprehending a thing, without making any affirmation or negation. See APPREHENSION and CONCEPTION.

Some writers have confounded idea and perception, whereas these are clearly distinguishable as the cause and effect: the one is an operation of the mind, and the other the result of that operation. See IDEA.

The faculty or power of perception constitutes what we call the understanding.

The faculty of perception seems to be that which constitutes the distinction between the animate and inanimate parts of the creation. Vegetables, some of them, have some degree of motion, and, upon different applications of other bodies, alter their figures and motions; so as hence to obtain the name of *sensitive* plants; which, however, is the result of mere mechanism, and no otherwise produced than the shortening of a rope by the effusion of water. But perception is a metaphysical principle, and is found in some degree in all animals; and in them alone.

Perception is a principle or power, the existence of which can only be known by consciousness, or the experience which every man has of what passes within himself: and it has been long ago observed (see Cic. *Tusc. Quæst. lib. i. § 28.*), that the mind is as incapable of comprehending the nature of perception, as the eye is of seeing itself. Nevertheless of all the operations of our minds, the perception of external objects is the most familiar. It is one main link of that mysterious chain which connects the material world with the intellectual. In this operation, many things are unaccountable; and these are sufficient to convince us, that we know but little of our own frame, and that a perfect comprehension of our mental powers, and of the manner of their operation, is beyond the reach of our understanding. In perception there are impressions upon the organs of sense,

the nerves, and brain, which, by the laws of our nature, are followed by certain operations of the mind. These two things, though apt to be confounded, ought to be carefully distinguished. Some philosophers have, without sound reason, concluded, that the impressions made upon the body are the proper efficient cause of perception; whilst others have, with as little reason, concluded, that impressions are made on the mind similar to those made on the body. It is universally allowed, that we perceive no external object but by means of certain bodily organs which God has given us for that purpose. This is so well known from experience, that it needs no proof; and, indeed, we can give no reason for it, but that such is the will of our maker. But, as we have reason to believe that the Supreme Being perceives every thing in a much more perfect manner than we can do, without bodily organs, and that there are other created beings endowed with powers of perception more perfect and extensive than ours, without such organs, we ought not to conclude, that such bodily organs are, in their own nature, necessary to perception; but rather that, by the will of God, our power of perceiving external objects is limited and circumscribed by our organs of sense; so that we perceive objects in a certain manner, and in certain circumstances, and in no other. We ought also to be cautioned against confounding the organs of perception with the being that perceives. Perception must be the act of some being that perceives. It is another law of our nature, that we perceive no object, unless some impression is made upon the organ of sense, either by the immediate application of the object, or by some medium which passes between the object and the organ: and in consequence of this law, well known and capable of the most familiar illustration, our powers of perceiving external objects are further limited and circumscribed. It is likewise a law of our nature, that, in order to our perception of objects, the impressions made upon the organs of sense must be communicated to the nerves, and by them to the brain. From such impressions some philosophers, both ancient and modern, have deduced conclusions, that are very doubtful, if not absolutely erroneous. Hence some have inferred, that man is nothing but a piece of matter so curiously organized, that the impressions of external objects produce in it sensation, perception, remembrance, and all the other operations of which we are conscious; or, because the Author of nature has established a constant connection between certain impressions on our senses and our perception of the objects by which the impression is made, that these impressions were the proper efficient causes of the corresponding perception. But this kind of reasoning supposes, that because two things are always conjoined, one must therefore be the cause of another (see CAUSE); and it supposes also that matter, by any motion or modification of which it is capable, may produce thought. Another conclusion, very generally deduced by philosophers from the facts above stated, is, that in perception an impression is made upon the mind, as well as upon the organ, nerves, and brain. They seem to think, that the object perceived acts upon the mind in some way similar to that in which one body acts upon another, by making an impression upon it; and this impression upon the mind is conceived to be something with regard to which the mind is altogether passive, and has some effect produced on it by the object. But this, says Dr. Reid, is an hypothesis which contradicts the common sense of mankind, and which ought not to be admitted without proof. Another conclusion drawn from the impressions made upon the brain in perception, which the author just named conceives to have no solid foundation, though it has been very generally adopted by philosophers,

PERCEPTION.

is this; that by the impressions made on the brain, images are formed of the object perceived; and that the mind, being seated in the brain as its chamber of presence, immediately perceives those images only, and has no perception of the external object but by them. (See IDEA and SOUL.) But whether the brain be the seat of the soul or not, it is alleged by our author, that there is no proof nor probability of the opinion that images of all the objects of sense are formed in the brain, with regard to any of them; and that with regard to the greater part of them, these are words without any meaning. Although it be allowed, that external objects make some impression on the organs of sense, and by them on the nerves and brain; yet it is most improbable, that these impressions resemble the objects by which they are made, so as that they may be called images of the objects: not to add, that the brain itself, being a soft, moist, medullary substance, is altogether improper for receiving and retaining such images. It is added, that the word "image," when applied to all objects of sense, except figure and colour, has absolutely no meaning. Our author further observes, with respect to another part of the hypothesis just stated, *viz.* that the mind perceives the images in the brain, and external objects only by means of them; that this is as improbable as that there are such images to be perceived. If our powers of perception, he says, be not altogether fallacious, the objects we perceive are not in our brain, but without us. Dr. Reid sums up what he has said, with regard to the organs of perception, and the impressions made upon our nerves and brain, in the following manner. "It is a law of our nature, established by the will of the Supreme Being, that we perceive no external object but by means of the organs given us for that purpose. But these organs do not perceive. The eye is the organ of sight, but it sees not. A telescope is an artificial organ of sight; the eye is a natural organ of sight, but it sees as little as the telescope. We know how the eye forms a picture of the visible object upon the retina; but how this picture makes us see the object we know not: and if experience had not informed us that such a picture is necessary to vision, we should never have known it. We can give no reason why the picture on the retina should be followed by vision, while a like picture on any other part of the body produces nothing like vision."

"It is likewise a law of our nature, that we perceive not external objects, unless certain impressions be made by the object upon the organ, and by means of the organ on the nerves and brain. But of the nature of these impressions we are perfectly ignorant; and though they are conjoined by the will of our Maker, yet it does not appear that they have any necessary connection with it in their own nature, far less that they can be the proper efficient cause of it. We perceive, because God has given us the power of perceiving, and not because we have impressions from objects. We perceive nothing without those impressions, because our Maker has limited and circumscribed our powers of perception by such laws of nature as to his wisdom seemed meet, and such as suited our rank in his creation."

Dr. Reid, having discarded the old ideal system, proceeds to the investigation of that act of the mind, of which we are all conscious, and which is denominated perception. If we attend to it, we shall find in it, he says, these three things: 1st, some conception or notion of the object perceived; 2dly, a strong and irresistible conviction and belief of its present existence; and, 3dly, that this conviction and belief are immediate, and not the effect of reasoning. After the illustration of these circumstances attending perception, and observing that thus he intended the account which he has

given of our perception of external objects as a faithful delineation of what every man come to years of understanding, and capable of giving attention to what passes in his own mind, may feel in himself, our author acknowledges that he is not able to shew, nor does he pretend to shew, in what manner the notion of external objects, and the immediate belief of their existence, are produced by means of our senses. "If the power of perceiving external objects, in certain circumstances, be a part of the original constitution of the human mind, all attempts to account for it will be vain. No other account can be given of the constitution of things but the will of him that made them: as we can give no reason why matter is extended and inert, why the mind thinks and is conscious of its thoughts, but the will of him who made both; so I suspect, we can give no other reason why, in certain circumstances, we perceive external objects, and in others do not." As to the manner in which the mind exercises its powers of perception, our author professes to give no theory of his own, though he has struck at the root of all the commonly received theories on this subject. Plato conceived that by our senses we perceived the shadows of things only, and not things themselves. He seems to have borrowed his notions on this subject from the Pythagoreans, as they probably derived theirs from Pythagoras himself. Allowing for Plato's allegorical genius, his sentiments correspond very well with those of his scholar Aristotle, and of the Peripatetics. The shadows of Plato may represent the species and phantasms of the Peripatetic school, and the ideas and impressions of modern philosophers. Two thousand years after Plato, Mr. Locke, who studied the operations of the human mind so much, and with so great success, represents our manner of perceiving external objects by a similitude very much resembling Plato's cave; and both the subterraneous cave of the ancient philosopher, and the dark closet of Mr. Locke, may be easily applied to all the systems of perception that have been invented. "For," as Dr. Reid states the matter, "they all suppose that we perceive not external objects immediately, and that the immediate objects of perception are only certain shadows of the external objects. Those shadows or images, which we immediately perceive, were by the ancients called *species, forms, phantasms*. Since the time of Des Cartes, they have commonly been called *ideas*, and by Mr. Hume *impressions*. But all philosophers, from Plato to Mr. Hume, agree in this, that we do not perceive external objects immediately, and that the immediate object of perception must be some image present to the mind. So far there appears an unanimity rarely to be found among philosophers on such abstruse points."

Philosophers, Berkeley and Hume excepted, believe the existence of external objects of sense, and call them objects of perception, though not immediate objects. But what they mean by a mediate object of perception they have not clearly explained. It seems to be their opinion, that we do not really perceive the external object, but the internal only; and that when they speak of perceiving external objects, they mean to express themselves in a popular or in a figurative sense; intimating that we perceive such objects as we perceive an absent friend when we look on his picture.

Besides what is common to philosophers in accounting for our perception of external objects, as above stated, some differences subsist among them. The ideas by which we perceive external objects are said by some to be the ideas of the Deity; but it has been more generally thought, that every man's ideas are proper to himself, and are either in his mind, or in his sensorium, where the mind is immediately present. The first is the theory of Malebranche; the second may be called the common theory. (See *CARTESIAN Philosophy*,

LEIBNITZIANISM, MALEBRANCHISM, PERIPATETICS, PLATONISTS, and PYTHAGOREANS. See also CONCEPTION, IDEA, QUALITY, REFLECTION, and SENSATION.) Dr. Reid, after giving a long account of the different theories advanced by philosophers, in order to account for our perception of external objects, closes with observing "that neither Aristotle's theory of sensible species, nor Malebranche's of our seeing things in God, nor the common theory of our perceiving ideas in our own mind, nor Leibnitz's theory of monads, and a pre-established harmony, give any satisfactory account of the power of the mind, or make it more intelligible than it is without their aid. They are conjectures, and if they were true, would solve no difficulty, but raise many new ones. It is therefore more agreeable to good sense, and to sound philosophy, to rest satisfied with what our own consciousness and attentive reflection discover to us of the nature of perception, than, by inventing hypotheses, to attempt to explain things which are above the reach of human understanding. I believe no man is able to explain how we perceive external objects, any more than how we are conscious of those that are internal. Perception, consciousness, memory, and imagination, are all original and simple powers of the mind, and parts of its constitution. For this reason, though I have endeavoured to shew that the theories of philosophers on this subject are ill grounded and insufficient, I do not attempt to substitute any other theory in their place. Every man feels that perception gives him an invincible belief of the existence of that which he perceives; and that this belief is not the effect of reasoning, but the immediate consequence of perception. When philosophers have wearied themselves and their readers with their speculations upon this subject, they can neither strengthen this belief nor weaken it; nor can they shew how it is produced. It puts the philosopher and the peasant upon a level; and neither of them can give any other reason for believing his senses, than that he finds it impossible for him to do otherwise." The objects of perception are the primary and secondary qualities of bodies (see QUALITY); and besides these, certain states and conditions of our own bodies; mechanical powers or forces; chemical powers; medical powers or virtues; and vegetable and animal powers; to one or other of which classes all the objects of perception may be referred. Reid's *Essays on the Intellectual Powers of Man*. Stewart's *Elements of the Philosophy of the Human Mind*.

PERCEVAL, SPENCER, in *Biography*, born Nov. 1, 1762, was son of John, the late earl of Egmont, by Catharine Compton, sister to Spencer, earl of Northampton, from whom he took the Christian name of Spencer. His mother was, in the year 1770, created a peeress of Ireland, in her own right, with the title of baroness Arden, and dying in 1784, she was succeeded by her eldest son Charles George, who, in July 1808, was raised to the peerage of England. Mr. Perceval's infancy was spent at Charlton, in Kent, the seat of his family, where he received the elements of his education. After this he went to Harrow school, where he was distinguished for the gentleness of his manners, the benevolence of his disposition, and the goodness of his heart. Those who knew him in early life were not surprized at the good fortune which distinguished him in his future prospects, nor at the warm attachment which his political and personal friends felt for him. At Harrow he was contemporary with sir William Jones; after having passed the usual time at this school, he was sent to Trinity college, Cambridge, where he formed some of the most valuable connections of his future life. As soon as he had completed his collegiate studies, he entered himself a member of Lincoln's Inn, and pursued the study of the law as a profession. He

VOL. XXVI.

was remarkable for close and regular application: he was aware that eminence was not to be obtained in the law without industry and perseverance, and in these he studied to excel. While employed as a barrister, he was particularly noticed for his mild and gentlemanly behaviour, which he displayed in an high degree when he became prime minister, and which in the senate called forth the well-merited encomiums of his warmest political opponents.

At an early period he was appointed counsel to the admiralty: in the year 1799 he was honoured with a silk gown, and about this time he was elected counsel for the university of Cambridge. In consequence of his uncle's death a vacancy was created in the borough of Northampton, which introduced Mr. Perceval into parliamentary life. He immediately gave his support to Mr. Pitt, and pursued the fame line of politics regularly and consistently through the remainder of his life.

Mr. Perceval had not been long in parliament before he attracted the marked attention of the minister, who it is said, being asked by his friend, Mr. Ryder, now lord Harrowby, when about to engage in a duel with Mr. Tierney, who was the fittest person to succeed him if he should fall in the contest, replied Mr. Perceval is that man. At this period he endeavoured to become thoroughly master of every branch of policy, dedicating his time and talents to the study of finance. In 1801, at the formation of the Addington administration, Mr. Perceval, then in his 39th year, was appointed solicitor-general, and in 1802 he was promoted to the situation of attorney-general, become vacant by the elevation of sir Edward Law, now lord Ellenborough, to the chief-justiceship of the court of king's bench. The only prosecution instituted by Mr. Perceval, in his character of attorney-general, worthy of notice, was that against Peltier, the editor of a French journal, printed in London, for a libel on Bonaparte.

Mr. Perceval retained his situation when Mr. Pitt resumed the reins of government, and continued to distinguish himself as a ready and staunch supporter of his measures. On the death of Mr. Pitt, Mr. Perceval, for the first time, appeared in the ranks of opposition, and it has been assumed, by those who were the witnesses of his parliamentary career at that period, that his talents were most conspicuous and marked when he rose as an opposition-speaker: in this character he was animated without asperity, earnest without ostentation, attached to his own party, without an indiscriminate contention with his adversaries.

When the Fox administration quitted office, towards the beginning of the year 1807, Mr. Perceval was appointed chancellor of the exchequer; but as the duke of Portland, who was first lord of the treasury, was very old and infirm, and seldom took an active or decided part in the administration of public affairs, Mr. Perceval was unquestionably, even then, the prime-minister of Great Britain, and upon the death of that nobleman he became so nominally as well as virtually. The situation of the country and of Europe at this period was very difficult: it required great talents, exercised with uncommon delicacy, as well as decision and vigour. The talents of Mr. Perceval can hardly be said to be of the first order; and it cannot be denied that the decision and vigour which he undoubtedly possessed, were not unfrequently mixed with something like precipitation and obstinacy. He seemed to have imbibed and acted upon a most dangerous idea, which a prime minister should never admit into his thoughts; *viz.* that a measure once openly avowed, ought, on no account, and under no circumstances, to be abandoned. The relative circumstances of Great Britain and of Europe most undoubtedly required political bravery:

they required that the prime minister of this country should have a mind above fear and embarrassing scruples: in short, that he should be able to take a comprehensive, profound, and cool view of the state of the world, and of the means which Britain possessed of preserving her honour and independence in Europe. When this view was once taken, then decided, firm, and prompt conduct corresponding to it was equally requisite. But it is obvious, that if decision, firmness, and promptitude are not preceded by thorough political knowledge, as well as the soundest political principles and views, they are capable of much mischief. This sort of knowledge Mr. Perceval did not possess in a degree which either the state of Europe required, or which could justify the pertinacity with which he adhered to measures that he had once adopted. The events of his administration are too near to render it necessary to refer to them seriatim. He was avowedly an enemy to those concessions to the Roman Catholics, which many statesmen, at least as wise, and possessing more powerful talents, regard as essential to the safety of the state. To his unyielding and unconciliatory temper, the American war in which we have been plunged has been imputed. His death was occasioned by the hand of an assassin, who was unquestionably mad. On Monday the 11th of May, 1812, about five o'clock in the evening, Mr. Perceval having walked from his house in Downing-street, was entering the lobby of the house of commons, where a number of persons were standing; he was shot by a person named Bellingham, formerly a merchant, but whose distresses had probably deranged his mind. Having committed the deed, he made no effort to escape. Being asked if he were the villain who had shot the minister, he replied, "I am, indeed, the unhappy man:" and at the bar of the house, during a short examination, being cautioned not to criminate himself, he said "I have admitted the fact: I do admit it: I have been denied the redress of my grievances by government: I have been ill treated. They all know who I am, and what I am; through the secretary of state and Mr. Becket, with whom I have had frequent communications. They knew of my intention six weeks ago, through the Bow-street magistrates. I have fought redress in vain. I am a most unfortunate man, and feel here," pointing to his heart, "sufficient justification for what I have done." No serious attempt was, however, made on his trial to prove insanity: indeed time was not allowed for his friends, who resided at Liverpool, to appear in his behalf. The deed was committed on Monday evening; he was tried and convicted on the following Friday, which was as soon as it could be known in Liverpool that his trial would come on at the sessions then in its course. Ample provision was made for Mr. Perceval's family by parliament.

As a public speaker, Mr. Perceval rose much in reputation and excellence, after he became minister: as the leading man in the house of commons, it was necessary that he should be able to explain and defend all his measures; and this duty, arduous under all circumstances, was particularly so in his case, as there was scarcely any other member of administration, in that house, competent to the task of relieving or supporting him. He, in a short time, proved that he stood in need of no assistance: he made himself so completely acquainted with every topic that was likely to be regularly discussed, that he was never taken unawares or at a loss. In the statement of his measures, he was remarkably methodical and perspicuous. By many persons he was deemed particularly to excel in his replies; in rebutting any severe remark that came unexpectedly upon him, and in turning the fact adduced, or the argument used, against his opponent. "His speeches," says one of his biographers, "if carefully exam-

ined, will let us completely into the nature and extent of his talents: they display no large and comprehensive views; the arguments and illustrations that they contain do not proceed on any philosophical and luminous principles: but they are distinguished by their detail, by taking up a detached argument, and grounding it on the particular circumstances of the case, rather than upon any general maxim. This species of public speaking, however, was well adapted to his audience, for in a mixed and numerous assembly, such as the house of commons, there will always be found many more persons who can comprehend particular arguments, than general reasoning, and who will deem the special pleader a man of much greater abilities, than a comprehensive and philosophical statesman." In domestic life, few men were more amiable and more respected than Mr. Perceval, and few men, even in the private walks of society, can pass a greater portion of time with their family, than did this prime minister of England. Gent. Mag. Month. Mag. New Ann. Register for the year 1812.

PERCH, POLE, or *Rod*, a long measure, much used in surveying and measuring of land.

Among the old Romans, and still among geometricians, the *pertica*, *perch*, is ten feet; and they otherwise call it the *catena*, *funis*, and *decempeda*.

In England, the statute perch contains five yards and a half, or sixteen feet and a half; and for coppice-woods, &c. eighteen feet. A square perch is thirty square yards and a quarter. Forty square perches make a rood, and one hundred and sixty an acre.

The customary perch is various in various counties: in Staffordshire it is twenty-four feet; in the forest of Sherwood twenty-one, the foot there being eighteen inches, the measure of which is marked in the chancel wall of Edwynd-flo, and in the church of St. Mary in Nottingham.

In Herefordshire, a perch of walling is sixteen feet and a half; a perch of ditching twenty-one feet, &c. In France, according to the old system, the perch is from eighteen to twenty-three, and even twenty-seven, of their feet.

The arpent, or acre, of land contains, in general, 100 square perches, but the perch varies in different parts of the country. The arpent of wood-land, however, is the same all over France, the perch being 22 feet long; this arpent, therefore, contains 48,400 French square feet = 6108 English square yards, or 1 acre, 1 rood, 1 perch. The arpent for cultivated land, in the neighbourhood of Paris, contains 900 square toises, or 4088 English yards; hence, 45 such arpents equal 38 English acres nearly. See MEASURE.

PERCH, or *Pole*, of a wheel carriage, is fastened to the middle of the hind axle-tree, and passes between the fore axle-tree and its bolster, being secured by the pole-pin, so as to move about it, and connecting the fore and hind carriages together. Thus A B (*Plate XXIII. Miscellany, fig. 7.*) represents the perch passing under the body of a coach, and fastened to the hinder axle at C. DE represents the fore axle, and W, W, the sections of the wheels. It is plain, that in turning a carriage of this construction, the larger the wheel, the sooner it will strike against the perch; and in the case represented in the figure, the wheel strikes against the perch when the axle makes the angle described by the dotted lines D, D. On this account, the fore wheels are usually made smaller than the hind ones; and notwithstanding this diminution of size, the turning of such carriages is attended with great inconvenience. In order to remedy this, many expedients have been adopted, particularly in coaches, chariots, and other light vehicles, to which the crane-necked perch could be conveniently applied.

plied. But as this could not be adapted to the heavier kinds of carriages, and is, besides, attended with a very considerable expence, Mr. Jacob has contrived a more simple and less expensive method of attaining the proposed end. For this purpose, instead of fixing the pin, passing through the perch at F, in the centre of the axle, he brings a projection backwards from it, as in *fig. 8*, and makes the axle with the wheels turn round the pin passing through that projection at P; in which case the angle, which the wheel makes with the perch, becomes considerably less, before the wheel strikes against it. So that a larger wheel, in a carriage of this construction, will not touch the perch so soon as a smaller wheel in a carriage of the ordinary construction; and whatever be the size of the wheels, the carriage will turn shorter than if it were constructed in the former method, with the centre-pin in the centre of the axle. This construction is attended with no additional expence, is applicable to all kinds of carriages, and is stronger than the usual mode of construction. Jacob's *Obs. on the Structure and Draught of Wheel Carriages*, 4to. 1773, p. 79.

PERCHANT, among *Fowlers*, a decoy-bird, which the fowler has fastened by the foot, and which flutters about the place where it is tied, to draw other birds to it, and give the fowler an occasion of catching them. See *DECOY*.

PERCHE, in *Geography*, a country of France, before the revolution, which had formerly courts of its own, and enjoyed its own laws, subject to the parliament of Paris. It at present forms the department of the Orne.

PERCIPANY, a town, or rather village, of America, in Morris county, New Jersey, on a branch of Passaic river; six miles N. of Morristown.

PERCIS, in *Ichthyology*. See *COTTUS Gobio*.

PERCIVAL THOMAS, M.D., in *Biography*, an eminent physician, was born at Warrington, in September 1740. Having lost both his parents in one day, he was placed at the age of four years under the protection of his uncle, Dr. Thomas Percival, a learned and respectable physician, resident at the same place; but of his parental guidance he was also deprived at the age of ten, after which his education was directed with the most kind and judicious attention by his eldest sister. His literary pursuits commenced at a private school in the neighbourhood of Warrington, whence he was removed, at the age of eleven, to the free grammar-school of that town, where he exhibited great promise of talent, and much industry. On the institution of the Warrington academy in 1757, under the direction of the Rev. Dr. Aikin, the Rev. John Holt, and the venerable Dr. Taylor, he was enrolled the first student of that well-known seminary. After prosecuting his studies there with diligence and reputation for the space of upwards of three years, he removed to the university of Edinburgh, at which place he employed the winters of 1761, and the two following years, in close application to the study of physic. In farther pursuit of medical improvement, he visited London in the winter of 1764; and, during his residence in the metropolis, he had the opportunity of pursuing with greater intimacy a connection, which had subsisted some time, with Hugh lord Willoughby of Parham. Having, through the medium of their common friend, the Rev. John Seddon of Warrington, been honoured with the friendship of that excellent and accomplished nobleman, he became the constant companion of his walks, and the familiar partaker of his social and literary entertainments. The warm attachment of his noble patron, the uncommon advantages he derived from his freedom of access to a mansion, which was the resort of the most celebrated literati of the day, and the occasions thereby offered of conciliating the esteem and confidence of persons of the

first consequence and rank, all conspired to suggest to him the resolution of fixing his residence in the metropolis. This project, however, was relinquished on the sudden death of his highly valued friend; an event, which, to his last moments, he never recollected, but with the tenderest expressions of regret. During the course of this winter, he was elected a fellow of the Royal Society.

The following year, 1765, he spent in visiting Paris, Hamburgh, and various other places on the continent; and having graduated at Leyden, he returned to his native town, where he resided a few months; and in March 1766 he married the only daughter of Nathaniel Bassnet, esq. a merchant in London. He now determined to make Manchester the theatre of his professional practice, and settled there in the year 1767, where he continued until his death, which happened in August 1804, in the unremitting exercise of his medical duties.

The character of Dr. Percival was in every way calculated to secure for him that eminence in his profession, and that general respect, esteem, and attachment, which he every where obtained. A quick penetration, a discriminating judgment, a patient attention, a comprehensive knowledge, and, above all, a solemn sense of responsibility, were the endowments which so conspicuously fitted him at once to discharge the duties, and to extend the boundaries, of the healing art; and his external accomplishments and manners were alike happily adapted to the offices of his profession. In social discussion, he possessed powers of a very uncommon stamp, combining the accuracy of science, and the strictest precision of method, with the graces of a copious and unstudied elocution; and to these was superadded the polish of a refined urbanity, the joint result of innate benevolence, and of early and habitual intercourse with the most improved classes of society. In few words, he was an author without vanity, a philosopher without pride, a scholar without pedantry, and a Christian without guile. Affable in his manners, courteous in his conversation, dignified in his deportment, cheerful in his temper, warm in his affections, steady in his friendships, mild in his resentments, and unshaken in his principles; the grand object of his life was usefulness, and the grand spring of all his actions was religion.

As a literary character, Dr. Percival held a distinguished rank. His earlier publications were devoted to medical, chemical, and philosophical inquiries, which he pursued extensively, combining the cautious but assiduous employment of experiment, with scientific observation, and much literary research. His papers were published collectively, under the title of "*Essays Medical and Experimental*," of which the first volume appeared in 1771, the second in 1773, and a third was subsequently added. These volumes obtained for the author a considerable reputation in the philosophical world, and have gone through many editions. The subjects which occupied his pen, in later years, were of a nature most congenial to his feelings; and in the several volumes of "*A Father's Instructions to his Children*," and of "*Moral Dissertations*," which appeared at different periods, through a space of twenty-five years, and which were originally conceived with the design of exciting in the hearts of his children a desire of knowledge and a love of virtue; there is to be found as much of pure style, genuine feeling, refined taste, apt illustration, and pious reflection, as can easily be discovered, in the same compass, in any didactic composition. His last work, which he expressly dedicated as a "parental legacy" to a much-loved son, under the title of "*Medical Ethics, or a Code of Institutes and Precepts, adapted to the professional conduct of Physicians and Surgeons*," published in 1803, is a monument of his professional integrity,

integrity, in which, while he depicted those excellencies of the medical character which he approved in theory, he unconsciously drew the portrait of himself, and described those which he every day exemplified in practice.

In addition to the works already mentioned, numerous papers on various subjects, all having the impress of the clearest understanding, and the most perspicuous style, are to be found in the publications of the Literary and Philosophical Society of Manchester, an institution to the establishment and reputation of which, he eminently contributed, and which did not cease to manifest its grateful sense of his merits, by the continued appointment of him to the presidency, from the date of its incorporation. See Monthly Magazine, September 1804. Duncan's Annals of Medicine, vol. viii., and Percival's Essays.

PERCKAM, in *Geography*, a town of Austria; 18 miles S.W. of Freystadt.

PERCOLATION. See FILTRATION.

Many have attempted the condensing of wines by percolation, or separating from them that superfluous moisture or water, which dilutes them below the true standard of vinous liquors, in order to make them richer, and fitter for keeping; but it does not appear that such attempts have as yet succeeded.

PERCOTE, in *Ancient Geography*, a town which belonged to Dardania, at a small distance S.W. of Lampfacus.

PERCUNOS, the name of an ancient Prussian idol. See POTRIMPOS.

PERCUSSION, in *Physics*, the impression a body makes in falling or striking upon another; or the shock or collision of the two moving bodies; which meeting, alter each other's motion. See MOTION.

Percussion is either *direct* or *oblique*.

In bodies either perfectly hard, or perfectly soft, and so void of all elasticity, the laws of percussion are easily determined; but since even the hardest bodies have their share of elasticity, and in elastic bodies the laws are very different, and much more intricate, having been first ascertained in the Philosophical Transactions, by sir Christopher Wren, Dr. Wallis, and Mr. Huygens, we shall lay down each apart; referring for another mode of illustrating the same subject to the article COLLISION.

PERCUSSION; *Laws of, in Bodies not Elastic*. 1. If a body in motion, as A (*Plat.* XXXIV. *Mechanics*, fig. 12.) strike directly against another at rest, B, the first will lose just as much of its motion as it communicates to the second; so that the two will proceed thence with an equal velocity, as if collected into one mass.

If A therefore be triple of B, A will lose one-fourth of its motion; so that if before it moved through a line of twenty-four feet in a minute, it will now only move eighteen.

2. If a moving body, A, strike against another already in motion, B; the first will increase the velocity of the latter, but will lose less of its own motion than if the latter had been at rest; since all here required is, that some degrees of motion be added to those the latter already had, to make them both proceed with an equal velocity.

Suppose, *e. gr.* the body A, with twelve degrees of motion, to strike against the other B, less by half, and at rest, the first will transfer four degrees of its motion to the latter, and retain eight to itself: but if it strike with twelve degrees of motion on the other already moving with three degrees, it will only communicate two degrees; for A being double of B, this needs only half the motion to make it proceed with the same velocity.

3. If a moving body, A, strike on another, B, either at

rest, or moving more slowly, and either in the same direction or in a contrary one; the sum of the momenta, if the bodies move in the same direction, or their difference, if they move in a contrary one, will be the same after the percussion as before.

4. If two equal bodies, A and B, meet each other with equal velocities; after the congress, they will both remain at rest.

5. If a body, A, strike directly on another at rest, B; its celerity after the stroke is to its celerity before it, as the weight of A is to the sum of the weights of A and B: if, therefore, the weights were equal, the celerity after the shock will be half of what it was before it.

Thus if $A = Q$, and its velocity before the stroke be denominated C , and $B = q$, then QC will express the whole quantity of motion before and after the stroke, and $\frac{QC}{Q + q}$,

or, the quantity of motion divided by the weights or quantities of matter, will be equal to V , the common velocity: hence we shall have $QC = V \times Q + q$; and, therefore: $C : V :: Q + q : Q$. If $Q = q$, it will be $C : V :: 2 : 1$.

6. If a body in motion, A, strike directly on another moving more slowly, but in the same direction; the velocity, after the shock, will be equal to the sum of the momenta, divided by the sum of the weights.

For the sum of the momenta both before and after the stroke is $QC + qc$, c being the velocity of q or B; therefore $V = \frac{QC + qc}{Q + q}$. Hence if $Q = q$, $V = \frac{Q \times C + c}{Q \times 2} = \frac{C + c}{2}$, or half the sum of the former velocities.

7. If two equal bodies, moving with different velocities, strike directly against each other; after the conflict, they will proceed with the semi-difference of the velocities with which they were moved before it.

For the quantity of motion is $QC - qc$, and, therefore, $V = \frac{QC - qc}{Q + q}$: and if $Q = q$, $V = \frac{QC - Qc}{2Q} = \frac{C - c}{2}$.

And if C also = c , $V = 0$, and, therefore, the quantity of motion is not always the same, as the Cartesians maintain.

8. If two bodies, A and B, meet directly with velocities that are reciprocally as their weights; after the conflict, they will both remain at rest: *i. e.* if $Q : q :: c : C$, $QC = qc$, and $V = \frac{QC - qc}{Q + q} = 0$.

9. If two bodies, A and B, meet directly with the same velocity; the celerity, after the impulse, will be to that before it, as the difference of the weights to their sum. For $QC - qC = V \times Q + q$; therefore, $V : C :: Q - q : Q + q$.

10. If two bodies meet directly, with any velocity whatever; the celerity after the stroke will be equal to the difference of the momenta, divided by the sum of the weights.

For $V = \frac{QC - qc}{Q + q}$.

To determine the momentum lost by the conflict: multiply the celerity which the body had before the conflict, into its mass; thus you have the momentum before the conflict. In like manner, multiply the celerity after the conflict into the mass; thus have you the momentum after the conflict. The latter momentum, therefore, being subtracted from the former,

PERCUSSION.

mer, leaves the loss. And hence may the magnitudes of the strokes be eliminated.

Thus in the three cases already recited, the momentum before the conflict is QC , $QC + qc$, and $QC - qc$; and V , or the celerity after the conflict, will be respectively

$$\frac{QC}{Q+q}, \frac{QC+qc}{Q+q}, \text{ and } \frac{QC-qc}{Q+q}, \text{ and the momenta of } Q$$

$$\text{in the several cases } \frac{Q^2C}{Q+q}, \frac{Q^2C+Qqc}{Q+q}, \text{ and } \frac{Q^2C-Qqc}{Q+q}:$$

therefore the quantities of motion lost by Q will be respectively

$$QC - \frac{Q^2C}{Q+q} = \frac{Qqc}{Q+q}, \quad QC - \frac{Q^2C+Qqc}{Q+q} = \frac{QCq-Qcq}{Q+q},$$

$$\text{and } QC - \frac{Q^2C-Qqc}{Q+q} = \frac{Qqc+Qqc}{Q+q}.$$

Hence it appears, in the first case, that the magnitude of the stroke, which is as the motion lost, will be as the celerity of the striking body; for if its celerity were C ,

the motion lost would be $\frac{QCq}{Q+q}$; but if it were c , the

motion lost would be $\frac{Qcq}{Q+q}$; and $\frac{QCq}{Q+q} : \frac{Qcq}{Q+q} :: C : c$.

In the second case, the magnitude of the stroke will be the same as if q had been at rest, and Q had struck it with the difference of their celerities; for the motion lost is

$$\frac{QCq - Qcq}{Q+q}; \text{ but in the case now supposed, the motion lost would be } \frac{Qq \times C - c}{Q+q} = \frac{QCq - Qcq}{Q+q}.$$

In the third case, the magnitude of the stroke will be the same as if either body, as q , had been at rest, and the other, as Q , had struck it with the sum of their celerities: for the motion lost is

$$\frac{QqC + Qqc}{Q+q}, \text{ and in the case now supposed it would be } \frac{Qq \times C + c}{Q+q} \text{ equal to the former.}$$

Hence it appears, that the magnitude of the stroke between two given bodies is always proportional to their relative, and not to their absolute celerities.

11. A direct or perpendicular stroke is to an oblique one as the whole sine is to the sine of the angle of incidence. For let BC (*fig. 13.*) be the body struck, A the striking body, AC the oblique stroke, aC the perpendicular stroke; and the magnitude of the perpendicular stroke aC will be to that of the oblique stroke in the direction AC as aC to AC , or as $AC : AB$. For resolving the force in AC into AB perpendicular to BC and AD parallel to it; and it is evident that the force in the direction AB is the only part of AC that strikes BC , the other part AD being parallel to it. But the magnitude of a perpendicular stroke of the same body moving with the same force is to be measured by the line $aC = AC$; and therefore it is to the magnitude of the oblique stroke as aC to AB , *i. e.* as AC to AB , or as radius to the sine of the angle of incidence.

PERCUSSION, *Laws of, in Elastic Bodies.* In bodies perfectly elastic, the force of elasticity is equal to the force with which they are compressed; that is, the collision of two such bodies on each other is equivalent to the motion which either of them would acquire, or lose, by mere simple impulse. This force exerting itself contrary ways, a

motion equivalent to it must be subtracted from the motion in the impelling body, and added to that in the body impelled by mere impulse, to find their velocities after percussion. See ELASTICITY.

12. If a body strike directly on an immoveable obstacle, either one or both of them being elastic; the body will be reflected with the same velocity with which it struck, and in the same line. For if the elasticity were away, the whole force of the striking body would be spent in overcoming the resistance of the obstacle; and consequently all the motion would cease: it follows, that the whole force is employed in compressing the elastic body; by which means it acquires an elastic force equal thereto: since then the elasticity, when the compressing force is spent, reduces the body into its former state, it repels the other with the same force with which it struck; consequently, it will rebound with the same velocity. And because an elastic body restores itself in the same direction in which it was compressed (there being no reason why it should change its direction) the body will rebound in the same right line.

13. If an elastic body strike obliquely on an immoveable obstacle, it will rebound in such manner as to make the angle of reflection equal to the angle of incidence. See this demonstrated with regard to light, by a method which applies to all impinging elastic bodies, under REFLECTION.

14. If an elastic body, A , strike directly against another at rest, B , equal to it; after percussion A will remain at rest, and B will proceed with the same velocity which A had before the shock, and in the same direction.

For if the bodies were not elastic, each would proceed, after the stroke, in the same direction, and with half the velocity; but since the elastic force acts in the same direction in which the compression is made, and is equal to the compressing force; it repels A with half its velocity, and therefore stops its motion: but it drives B farther with half its velocity, and therefore accelerates its motion. It is therefore carried after the shock, with the whole celerity with which A was carried before it, and A remains at rest. The quantity of motion before the stroke is QC , and the motion lost by percussion, being the double of that lost

between non-elastic bodies, is $\frac{2CQq}{Q+q}$; therefore the momentum after the stroke will be $QC - \frac{2CQq}{Q+q} =$

$$\frac{Q^2C - QCq}{Q+q}; \text{ and } V = \frac{QC - Cq}{Q-q}; \text{ and the velocity of } q, \text{ whose motion is equal to that lost by } Q, \text{ is equal}$$

$$\text{to } \frac{2QCq}{Q+q} \div q = \frac{2QC}{Q+q}. \text{ If } Q = q, V = \frac{QC - CQ}{Q+q} = 0; \text{ and } v = C.$$

Hence, since A (*fig. 14.*) transfers all its force to B ; B , in like manner, will transfer it to C , C again to D , and D to E . Wherefore, if there be several equal elastic bodies, mutually touching each other, and A be struck against B , all the intermediate ones remaining at rest, the last alone, E , will be moved, and that with the velocity with which A struck against B .

15. If an elastic body, A , strike directly on another at rest, B ; its velocity, after percussion, will be to its velocity before it, as the difference of weights is to their sum: but the velocity it communicates to B , is to the same, as double the weight of A to the sum of the weights.

After percussion, therefore, the velocity of A is to the velocity

velocity

PERCUSSION.

velocity of B, as the difference of weights to the double of A.

Thus, $V = \frac{QC - Cq}{Q + q} = \frac{Q - q \times C}{Q + q}$; therefore, $V \times \overline{Q + q} = \overline{Q - q} \times C$; consequently, $V : C :: Q - q : Q + q$. And because $v = \frac{2QC}{Q + q}$, $v : C :: 2Q : Q + q$. Consequently $V : v :: Q - q : 2Q$.

16. If a greater body strike a less body at rest, the velocity given to it will be less than the double of its own velocity. If $Q > q$, let $Q = mq$, then $v = \frac{2QC}{Q + q}$ will be equal to $\frac{2mqC}{mq + q} = \frac{2C}{1 + \frac{1}{m}} < 2C$.

17. The velocity which a greater body gives to a less body at rest, is to that which the less body moved with the same velocity would communicate to the greater body at rest, as the magnitude of the greater to the magnitude of the less body. If $Q > q$ is supposed to be at rest, then $v = \frac{2QC}{Q + q}$; but if Q be at rest, and q strike it with the celerity C, the velocity of Q after the stroke would be $\frac{2qC}{q + Q}$; therefore the velocity given by the greater body is

to that given by the less as $\frac{2QC}{Q + q} : \frac{2qC}{q + Q} :: Q : q$.

18. If a greater body strikes against a less, the greater body will not come to rest, but move more slowly: for since $Q > q$, $Q - q$ will be positive, and therefore, in the proportion $Q + q : Q - q :: C : V$, V will be positive but less than C, because $Q - q < Q + q$.

19. Again, if an elastic body strike a larger elastic body at rest, the smaller body will always rebound, and move in a contrary direction to what it did at first, and also give the larger body a greater quantity of motion than what was originally in the smaller body. For as $q > Q$, $Q - q$ will be a negative quantity, and, therefore, V will be negative, or Q will move backwards. And this quantity of motion communicated, may be greater than the original motion in any ratio less than that of 2 to 1: For supposing the small body and its velocity to be denoted by unity, and the larger body at rest by x, the velocity

of x after the shock will be $\frac{2}{1 + x}$, and its quantity of motion will be $\frac{2x}{1 + x}$. But though the proportion of

$2x$ to $1 + x$ increases when x increases, yet its limit will be the proportion of 2 to 1; which is the limit to which the motion of x may approach indefinitely near.

Hence it follows, that if the force of moving bodies be measured by their quantity of motion, a body may, by percussion, immediately communicate a greater force than itself has to another, and this in any proportion less than double.

But if other elastic bodies be interposed, a body may mediate communicate a greater force than its own to another larger body x, in any proportion less than that of x, x to 1. Thus, if $x = 1000000$, the body 1, with the velocity 1, may, by the means of intermediate bodies, give it the force 999000000; and the sum of the

absolute forces of all these bodies taken together, arising from the percussion, may exceed the force of the first or unity, in any ratio less than $2x, \sqrt{x}$ to 1, or 200000000 to 1, although the relative force in all cases remains as at first = 1.

These are paradoxes which cannot be urged against those who maintain the forces of bodies to be measured by their masses and the squares of their velocities.

It is also to be observed, that those who measure force by the quantity of motion, must deny that there is any force lost by the impressions, made on soft bodies, or by the bending of elastic bodies; for if any were lost from such causes, the sum of the quantities of motion of bodies moving the same way, could not remain the same before, during, and after the shock, which is an universal rule admitted by the Newtonians. But they admit that a spring bent between two bodies may, by unbending itself, generate motion in these bodies. Hence it follows that, according to this doctrine, though a spring may give motion to bodies, it cannot, by a contrary action, take it away; which seems no small paradox. See FORCE.

20. If a body, A, moves towards the body C, at rest, and an intermediate body, B, of a mean magnitude, be placed at rest between them, so that A first impels B, and then B impels C, a greater motion will be given to C than if A had struck it directly. And if B be a mean proportional between A and C, the velocity communicated to C will be the greatest that can be. Huygens, de Mot. Corp. ex Percuss. prop. 12.

In the preceding series of proportional magnitudes, $B + \frac{AC}{B} < A + C$. For $A : B :: B : C$, therefore $A - B : B :: B - C : C$, and $A - B : B - C :: B : C$; but $C < B$, therefore $B - C < A - B$; and therefore $B < A - B + C$, and $2B < A + C$; but $B = \frac{AC}{B}$; therefore

$B + \frac{AC}{B} < A + C$. The same proposition might be demonstrated, if C were the greatest body, and A the least.

Now it is plain, that the velocity of the body C, struck only by A, would be $\frac{2Aa}{A + C} = \frac{4Aa}{2A + 2C}$, a denoting the velocity of A: the velocity of B, struck immediately by

A, would be $\frac{2Aa}{A + B} = b$, b denoting the velocity of B: and, therefore, the velocity of C, struck by B, moved

with the velocity b, would be $\frac{2Bb}{B + C} = \frac{2B \times 2Aa}{B + C \times A + B}$

$= \frac{4BAa}{BA + BB + CA + CB} = \frac{4Aa}{A + B + \frac{CA}{B} + C}$.

But $\frac{4Aa}{A + B + \frac{CA}{B} + C} : \frac{4Aa}{2A + 2C} :: 2A + 2C :$

$A + B + \frac{CA}{B} + C$. And the second antecedent is evidently

greater than the second consequent; therefore the first antecedent is greater than the first consequent. But if B were a mean

PERCUSSION.

a mean proportional between A and C, $B + \frac{AC}{B}$ would be less than in any other case. For if $B = m$ the mean proportional, $B + \frac{AC}{B} = m + \frac{m^2}{m} = 2m$; but if $B = m \pm D$, then $B + \frac{AC}{B} = m \pm D + \frac{AC}{m \pm D}$; *i.e.* $m^2 \pm 2mD + D^2 + AC (= m^2) > 2m^2 \pm 2mD$.

If more bodies be interposed between A and C, the motion of C will be greater; and it will be the greatest when the bodies interposed constitute a series of mean proportionals between A and C. *Ibid.* prop. 13.

21. If there be a series of a hundred bodies in the proportion of 1, 2, 4, 8, 16, &c. and the motion begins by the greatest body, the velocity communicated to the smallest will be to that with which the greatest moved nearly as 2,338,500,000,000 to 1. And, if the motion begins by the least body, the quantity of motion will be increased on the whole nearly as 1 to 4,677,000,000,000. But it is to be observed, that there is a mistake in the impression of Huygens's book, as to the first number, which is there printed 14,760,000,000, instead of 2,338, &c. so that the velocity thus given to the smallest body is 150 times greater than what the printed copy of Huygens assigns. Bernoulli, *Disc. fur le Mouv. Oper.* tom. iii. p. 34. and s'Gravesande, *Prof. ad Huygen. Oper. Post.* tom. ii. *Amst.* 1728.

This stupendous augmentation of the quantity of motion is a remarkable instance of the falsity of the Cartesian principle, that the same quantity of motion is always preserved in the world.

Some have thought this augmentation no small difficulty against those who maintain the moving force or power of action in bodies, to be proportional to their quantities of motion. This difficulty does not press the Leibnitzians; for it is to be observed, that notwithstanding the prodigious increase of motion here assigned, yet there is no increment of the *vis viva* of this system of bodies. See FORCE and VIS *Viva*.

A learned author has urged, that if the force of bodies were in proportion to their quantities of motion, the increase in the motion here mentioned might be employed to restore the motion of the first body, and hence make a perpetual motion. But it is answered, that as the motion of the last is increased in the same direction with the first, the motion of all the rest will be in the contrary direction, and equal to that of the last diminished by unity: hence the sum of the motions in the same direction remains as it did, equal to that of the first and smallest body, which we suppose unity. See Maclaurin's *Demonstrat. de Loix du Choc des Corps*, p. 21, Paris, 1724; and s'Gravesande, *Rem. fur la Possibilité du Mouvement perpetuel*, in *Journ. Liter.*

It is to be observed, that there is a limit which the velocity communicated to the last body never amounts to, (supposing the first and last bodies, and the velocity of the first before the stroke, to be given,) but to which it approaches continually, while the number of such bodies interposed between the first and last is always increased. And this limit is to the velocity of the first body before the stroke, in the subduplicate ratio of the first body to the last.

Mr. Huygens has not mentioned this limit, but the curious may see the determination of it in Mr. Maclaurin's *Fluxions*, art. 514.

22. If two equal elastic bodies, A and B, meet directly, and with equal force; each will rebound with the

same velocity with which it struck, and also in the same direction.

For setting aside the elasticity, both would remain at rest; their whole force, therefore, is spent in the compression; but their elastic force, whereby they rebound in the former direction, is equal thereto. This force, therefore, acting equally on each body, A and B, will produce the same celerity in each; and that equal to the former. So that they will rebound with the celerity with which they struck.

23. If two equal elastic bodies, A and B, strike directly against each other with unequal velocities: after the shock, they will rebound with interchanged velocities.

For suppose the bodies to concur with the velocities $C + c$ and C : if they meet with the same velocity C , after the shock, they would both move with the same velocity C .

If B were at rest, and A should strike upon it with the celerity c ; after the shock, A would remain at rest, and B be moved with the celerity c . Therefore the excess of the celerity c , with which A is carried, is transferred wholly by the conflict to B: A, therefore, is moved with the celerity C , and B with the celerity $C + c$.

Hence, after percussion, they recede from each other with the same velocity as before they concurred.

The two propositions in these two last articles may be proved otherwise, thus: the momentum of Q before the

stroke is QC ; the motion lost by it is $\frac{2QCq + 2Qcq}{Q + q}$;

therefore, its quantity of motion after the stroke will be $QC - \frac{2QCq + 2Qcq}{Q + q} = \frac{Q^2C - QCq - 2Qcq}{Q + q}$.

Consequently $V = \frac{QC - Cq - 2qc}{Q + q}$.

The quantity of motion in q before the stroke is $-qc$, and that lost by Q and acquired by q is $\frac{2QCq + 2Qcq}{Q + q}$;

and, therefore, its momentum after the stroke will be $-qc + \frac{2QCq + 2Qcq}{Q + q} = \frac{2QCq - q^2c + Qcq}{Q + q}$; and

$v = \frac{2QC - qc + Qc}{Q + q}$. But when $Q = q$, $V =$

$\frac{QC - QC - 2Qc}{2Q} = -c$, and $v = \frac{2QC - Qc + Qc}{2Q} = C$.

24. If two elastic bodies, A and B, strike directly on each other with velocities that are reciprocally proportional to their weights: after collision, they will rebound with the same velocity with which they met.

For $Q : q :: c : C$, therefore $CQ = cq$; and $V = \frac{QC - 2QC - Cq}{Q + q} = -\frac{QC - Cq}{Q + q} = \frac{Q + q \times -C}{Q + q}$

$= -C$; and $v = \frac{2qc - qc + Qc}{Q + q} = \frac{qc + Qc}{Q + q} = +c$.

25. If an elastic body, A, strike on another equal one indented with a less degree of motion B; after percussion, both will proceed in the same, *viz.* in the former direction, and with interchanged velocities.

For suppose A to strike with the velocity $C + c$, upon B moving with the velocity C . Since by reason of the equal

PERCUSSION.

equal velocities C and C , there arises no impulse; it is the same thing as if A struck on B , with the sole celerity c , on B at rest. But in that case A would remain at rest, and B would move with the velocity c : therefore, after percussion, A will move with the sole celerity C , and B with the celerity $C + c$, both according to the former direction, there being nothing to change that direction.

For in this case, the quantity of motion in Q before the stroke is QC , the motion lost by it is $\frac{2QCq - 2Qcq}{Q + q}$, and the quantity of motion after the stroke will be $QC - \frac{2QCq - 2Qcq}{Q + q} = \frac{Q^2C + 2Qcq - QCq}{Q + q}$; and therefore $V = \frac{QC + 2cq - Cq}{Q + q}$.

The momentum of q before the stroke is qc , that lost by Q and acquired by q is $\frac{2QCq - 2Qqc}{Q + q}$; therefore the momentum of q after the stroke will be $qc + \frac{2QCq - 2Qqc}{Q + q} = \frac{q^2c + 2QCq - Qqc}{Q + q}$; and $v = \frac{2QC + qc - Qc}{Q + q}$.

In the case here supposed $Q = q$, therefore $V = \frac{QC + 2Qc - CQ}{2Q} = c$, and $v = \frac{2QC + Qc - Qc}{2Q} = C$.

26. If a moving body, A , strike on another, B ; the stroke will be the same as would be made by the body A striking on B at rest, with the difference of their velocities.

Hence, since the elastic force is equal to the percussion; it acts on the bodies A and B with the difference of the velocities they had before the congresses.

27. To determine the velocities of any two elastic bodies, A and B , after striking directly on each other with any velocities.—If the elastic body A strike on B , either at rest, or moving faster than A ; the velocity, *v. gr.* of A after percussion is found thus: as the sum of the weights is to double of either of them, suppose of B , so is the sum of the velocities before collision, to a velocity which, subtracted from the velocity of A before collision, leaves its celerity after collision.

If the two elastic bodies, A and B , meet each other; the velocity of A , after the impulse, is found thus: as the sum of the weights is to the double of either of them, suppose of B , so is the sum of the velocities before collision, to a velocity which, subtracted from the velocity of A before collision, leaves its celerity after collision.

28. In the direct collision of bodies the same respective velocity is preserved, *i. e.* in a direct concurrence, the difference of velocities is the same before and after the shock; and in a direct mutual encounter, the difference of velocities after the shock is the same with their sum before it.

Hence they retire from each other, after the impulse, with the same velocity with which they met.

Thus $v - V = C \mp c$, For $v = \frac{2QC \pm qc \mp Qc}{Q + q}$,

and $V = \frac{QC \pm 2qc - Cq}{Q + q}$; therefore $v - V = \frac{2QC \pm qc \mp Qc - QC \mp 2qc + Cq}{Q + q} = \frac{QC \mp qc \mp QC + Cq}{Q + q} = \frac{Q + q}{Q + q} \times \frac{C \mp c}{Q + q} = C \mp c$.

29. In the collision of elastic bodies there is not always preserved the same momentum, or, as the Cartesians express it, the same quantity of motion; but this is sometimes increased, and sometimes diminished.

It is a mistake, therefore, of Descartes, and his followers, that the same quantity of motion is still preserved in the world.

Thus, let q at rest be greater than the impinging body Q ; and the quantity of motion will be increased by collision: let $q = Q + x$, and C the velocity of Q : the velocity of the body q after the stroke will be $\frac{2QC}{Q + q} =$

$\frac{2QC}{2Q + x} = C - \frac{x C}{2Q + x}$; but the velocity of the body

Q will be $\frac{QC - Cq}{Q + q} = \frac{-x}{2Q + x}$; therefore the absolute momentum of q after the stroke will be $= q \times C -$

$\frac{x C}{2Q + x} = \overline{Q + x} \times C - \frac{x C}{2Q + x}$.

But the momentum of the body Q is $= Q \times -\frac{x C}{2Q + x}$;

and the quantity of motion in both bodies will be $= \frac{2Q^2C + 2QxC + QxC}{2Q + x} = \frac{2Q^2C + 3QxC}{2Q + x} = QC$

$+ x C - \frac{x^2 C}{2Q + x}$; but the quantity of motion before

the stroke was QC , which is less than the former quantity, because $\frac{x^2 C}{2Q + x} < x C$; for $\frac{x^2 C}{x} = x C$. If the bodies

return to a second stroke with the velocities acquired by the first, they will recover their first velocities, in which case the quantity of motion will be diminished.

30. If two elastic bodies, A and B , meet or overtake each other directly; the sum of the factums of the masses into the squares of the velocities remains the same, before and after the congress; hence the same quantity of force is likewise preserved in the congresses.

31. To determine the motion of two bodies, A and B , (*fig. 15.*) striking obliquely against each other, whether they be elastic or not elastic.—The motion of the body A along AC is resolvable into two others, in the directions AE and AD ; and the motion of B along BC into two others according to BF and BG : and the velocities through AD and BF are to the velocities through AC and BC as the right lines AD , BF , AC , BC : now since the right lines AE and BG are parallel, the forces acting according to these directions are not mutually opposite, and must therefore be considered in the congresses.

But since the lines AD and BF , or, which is the same, EC and GC , constitute the same right line perpendicular to DC ; it is the same as if the bodies A and B should meet directly with velocities that are as EC

and

and G C. Find, therefore, the velocity of A and B according to the rules above laid down.

Suppose, *e. gr.* the velocity of the rebounding body A to be as C H; since the motion along A E is not changed by the congress, make C K = A E, and complete the parallelogram H C K I; the diagonal C I will represent the motion of A after the congress: for, after percussion, the body will move according to the direction C I, and with a velocity as C I. In the same manner it will be found, that the rebounding body B will move along the diagonal of the parallelogram C M; in which L M = B G. The velocities, therefore, after percussion, are as C I to C M.

PERCUSSION, *Centre of.* See CENTER of Percussion.

PERCY, in *Geography*, a town of France, in the department of the Channel, and chief place of a canton, in the district of St. Lo; 12 miles S. of St. Lo. The place contains 2952, and the canton 9580 inhabitants, on a territory of 160 kilometres, in 13 communes.

PERCY, an extensive township of America, in Grafton county, New Hampshire, watered by the several branches of Upper Ammonoosuck river, bounded W. by Northumberland, on Connecticut river; incorporated in 1774, and containing 148 inhabitants.

PERDICCAS, in *Biography*, one of the captains of Alexander the Great, was a Macedonian of noble birth, and rose to high favour with his master, in whose conquests he bore a considerable part. Alexander, in his last illness, entrusted his ring to Perdicas, who, at a meeting of the great officers after the death of the conqueror, resigned the ring, together with any authority it might be supposed to convey. When Aridæus, the brother of Alexander, was appointed to the succession, Perdicas gained a considerable ascendancy over him, and procured the death of Meleager, the commander of the Macedonian phalanx, of whom he was jealous. At the division of honours and provinces among the great officers, he was nominated general of the household troops, and exercised the protectorate of the Macedonian princes, Aridæus, and the new-born son of Alexander by Roxana, though Craterus had the title of protector. In conjunction with Roxana, he removed all who could be competitors to the crown, and conducted the government with great cruelty. Ambitious of extending his power, he repudiated his wife Nicæa, the daughter of Antipater, and married Cleopatra, the daughter of Philip, and sister of Alexander, at the proposal of Olympias, her mother. A league being formed against him, between Ptolemy, Antipater, and Craterus, he resolved to march into Egypt against the first, while Eumenes, who adhered to him as guardian of the royal family, should make head against the others. Perdicas, on entering Egypt, found some symptoms of disaffection in his troops, which he was at first disposed to treat with severity, but finding that this method would not succeed, he changed his conduct, and behaved to them with great condescension, insomuch that they were induced to cross the Nile, and attack Ptolemy in his intrenchments. After a bloody action, they were repulsed, and great numbers of them were drowned in repassing the river. At length their discontents were so high, that they mutinied; and a party of horse, surrounding the tent of Perdicas, murdered him in the year B.C. 321, two years after the death of Alexander. Univ. Hist.

PERDICIUM, in *Botany*, appears to have been so called by Linnæus, on account of a considerable resemblance between his original species, *semiflosculare*, and his *Leontodon* (now *Hieracium*) *bulbosum*. The latter was thought

by some to be the *περδικιον* of Theophrastus, which received that appellation, as the Greek writer expressly mentions, because partridges frequented the plant and scratched its roots out of the ground. Various other tuberous-rooted herbs have indeed been taken for the ancient *περδικιον*, but these are not to our present purpose. The roots of the Linnæan *Perdicium semiflosculare* are copious, long, and fleshy, and we cannot doubt that hence arose the scarcely warrantable assumption of an old Greek name, for a Cape and American genus, though that name had hitherto not been, with any certainty, appropriated. Linn. Gen. 428. Schreb. 559. Willd. Sp. Pl. v. 3. 2116. Mart. Mill. Diët. v. 3. Vahl. in Coperh. Transf. v. 1. fasc. 2. 8. Ait. Hort. Kew. ed. 2. v. 5. 84. Juss. 181. Lamarck Illustr. t. 677. Gærtn. v. 2. 450. t. 170. (Trixis; Browne Jam. 312?)—Class and order, *Syngenesia Polygamia-superflua*. Nat. Ord. *Compositæ discoidea*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common Calyx* oblong, of many lanceolate imbricated leaves; the innermost scarcely longer than the corolla. *Cor.* compound, imbricated, radiated. Florets of the disk perfect, tubular, cloven half way down; their inner lip deeply divided, sharp-pointed, equal; outer three-cleft half way down, linear, equal; those of the radius female, linear, tongue-shaped, three-toothed, with two teeth at the base on the inner side. *Stam.* in the perfect florets, filaments five, short; anthers forming a cylindrical tube, with five teeth. *Pist.* in the same, germen small; style simple; stigma cloven, obtuse: in the female ones, germen small; style cloven half way down; stigmas obtuse. *Peric.* none, except the unchanged calyx. *Seeds* solitary, obovate. *Down* capillary, sessile, rough, very abundant, the length of the calyx, level-topped. *Recept.* naked.

Obs. The flower resembles a semiflosculous one, though it is truly radiated. The characters were taken from the first species, *P. semiflosculare*; the *radiale*, though agreeing in the character of the two-lipped florets, differs entirely in habit. Linn. Vahl considers the florets as all uniform, and therefore places this genus in the order *Polygamia equalis*.

Eff. Ch. Receptacle naked. Florets two lipped. Down capillary, rough.

1. *P. semiflosculare*. Linn. Sp. Pl. 1248. Amoen. Acad. v. 6. 103. Thunb. Prodr. 160. (P. Taraxici; Vahl. n. 1. t. 1. Willd. n. 1.)—Stalks radical, single-flowered. Leaves runcinate, smooth, with rounded lobes.—Native of the Cape of Good Hope, in muddy places. The root is perennial, long and tuberous, with numerous, long, cylindrical, thick, fleshy fibres, running deep into the ground, totally misrepresented in Vahl's plate. *Stem* none. *Leaves* numerous, radical, spreading, stalked, three or four inches long, runcinate, obtuse, smooth; their numerous lobes short, broad, rounded, slightly toothed. *Footstalks* linear, their permanent fibrous remains crowning the root, and surrounding the present leaves. *Flower stalks* one or two, ascending, simple, round, woolly, rather longer than the leaves, each usually bearing one linear *bractea*, towards the top. *Flower* somewhat drooping, large. *Calyx* like a *Scorzonera*. *Seed down* very copious and dense, shining, rather tawny, an inch long. This plant has indeed much of the aspect of a Dandelion, but we cannot submit to the change of a good Linnæan name, expressive of the habit of the flower, for a new one of a very faulty construction.

2. *P. tomentosum*. Thunb. Jap. 319. Vahl. n. 2. t. 2. Willd. n. 2.—Stalk radical, single-flowered, with several awl-shaped bractæ. Leaves lyrate, downy beneath.—Gathered by Thunberg in Japan, flowering in April and

PERDICUM.

May. Smaller and more downy than the former, with lyrate leaves, whose terminal lobe is heart-shaped and wavy, with slight teeth. Flowers much smaller, with a purple radius and yellow disk.

3. *P. Anandria*. Siberian *Perdicum*. Brown in Ait. Hort. Kew. ed. 2. v. 5. 84. (*Tussilago Anandria*; Linn. Sp. Pl. 1213. Willd. Sp. Pl. v. 3. 1962. T. scapo unifloro, calyce clauso; Linn. Hort. Upf. 259. t. 3. f. 1. Gmel. Sib. v. 2. 141. t. 68. f. 1. *Anandria*; Linn. Amœn. Acad. v. 1. 243. t. 11.)—Stalk radical, single-flowered, with several awl-shaped bracteas. Leaves lyrate, acute, denudated on both sides. Calyx closed, longer than the florets. —Native of Siberia, in mountainous fields. Cultivated by Miller in 1759. It flowers in March and is perennial, but has nothing to recommend it as a garden plant, except botanical singularity. The root, according to Gmelin, consists of many fleshy spreading fibres, like that of *Asphodel*. Leaves radical, stalked, lyrate, minutely toothed; when young cottony beneath, but becoming naked and smooth, on both sides, when fully grown; their terminal lobe larger, more ovate, and acute, than in the last. Flower-stalk a foot high, much taller than the leaves, cottony, with several awl-shaped bracteas. Flower nearly globose; its calyx downy, closed, rising much above the florets, which appear to have the proper characters of *Perdicum*, as was first pointed out by Mr. Brown. The whole habit of the plant, compared with the two preceding species, confirms his determination of the genus.

4. *P. populifolium*. (*Tussilago scapo imbricato, unifloro, foliis ovatis, oblongis, ex sinuato dentatis*; Gmel. Sib. v. 2. 141. t. 67. f. 1.)—Stalk radical, single-flowered, with several sheathing bracteas. Leaves ovate, wavy, toothed; densely woolly beneath. Root creeping.—Native of Siberia, in stony places. We cannot but think this must be a distinct species from the last. The root creeps among stones, and is not thicker than a crow's quill. Leaves simple, (not lyrate,) wavy or coarsely toothed; cottony beneath at all times; clothed with deciduous down on the upper side when young, but afterwards smooth and shining, of a dark purplish hue. Flower-stalk invested with three or four broad, sheathing, finally smooth bracteas. Flowers white. Calyx chiefly downy at the base, scarcely more than half the length of the spreading radius, which is white.

With respect to Gmelin's *Tussilago* n. 124. t. 67. f. 2, it differs from this last in having somewhat lyrate leaves, far less cottony beneath, and a very few linear bracteas. This appears to be what Linnæus has figured in Hort. Upf. t. 3. f. 2, under the name of *Bellidiflorum*. He speaks of it as a variety of *Anandria*, with elongated radiant florets, caused by being planted in a pot, or an open dry situation. Gmelin seems not to have been satisfied with this decision, and advised the cultivation of both plants, from seed. We are also well aware of the fallibility of cultivators, and think it not impossible, that Linnæus might have received the roots of both the plants in question, without distinguishing them, and thus have been led to consider the subsequent difference in their produce as accidental. We will not however presume to decide this question, any further than that we have no doubt of the permanent difference between our *P. populifolium* and Gmelin's t. 67. f. 2; which last, if not distinct, must be a variety of *Anandria*, with which its bracteas and habit most nearly agree. Gmelin's original specimens are all before us in the Linnæan herbarium. In the moment of writing this article, the fourth and fifth volumes of the Hortus Kewensis have reached us, and have led to the above investigation. This valuable publication being now complete, we need not in future note the edition to which

we refer, except when we may occasionally want to cite the first.

5. *P. purpureum*. Vahl. n. 3. t. 3. Willd. n. 3.—Stems mostly simple, nearly leafless, ascending. Flowers solitary. Leaves pinnatifid, cut, loosely woolly. Radius revolute. —Gathered by Commerçon in the Straits of Magellan. The root is perennial, with long slender fibres. Stems several, ascending three or four inches high, simple or rarely divided, loosely woolly, bearing usually one pinnatifid leaf near the base, and several alternate, linear, undivided ones higher up. Leaves mostly radical, stalked, clothed with fine, long, lax, deciduous wool, deeply pinnatifid; their segments ovate or wedge-shaped, deeply and irregularly cut; their margins generally entire and smooth, but now and then minutely spinous. Flowers terminal, solitary, about an inch wide. Radiant florets ovate, entire, revolute, purple. Down more feathery than in the rest. Our specimen was given by Thouin to the younger Linnæus.

6. *P. magellanicum*. Linn. Suppl. 376. Willd. n. 4. Vahl. n. 4. t. 4.—Stem simple, single-flowered, lispid, nearly leafless. Leaves pinnatifid; their segments rounded, undivided, fringed. Radius spreading.—Gathered by Forster and Commerçon in the Straits of Magellan. Root much like the last. Stem solitary, from two to five inches high, slightly leafy, reddish, rough all over with minute, prominent, glandular points. Leaves chiefly radical, numerous, spreading, about two inches long including their footstalks, deeply pinnatifid, and somewhat lyrate, with numerous, opposite, rounded, entire segments, smooth on both sides, but densely bordered with minute bristles. Flower solitary, twice the size of the last, white, with spreading oblong radiant florets, toothed at the end. Leaves of the calyx bordered with purple, roughish, partly fringed. Seed-down rough, not feathery. This is a very elegant plant, on account of the regularity of its leaves, which resemble those of a *Lepidium*, and the size as well as beauty of the flower.

7. *P. nervosum*. Thuab. Prodr. 160. Willd. n. 5.—“Leaves simple; downy and ribbed beneath.”—Native of the Cape of Good Hope. We have seen no specimen of this or the next.

8. *P. chilense*. Willd. n. 6.—“Stem leafy, single-flowered. Leaves linear-lanceolate, stalked, serrated at the extremity.”—Native of Chili.—Root perennial. Stems several, a span long, ascending, smooth, leafy, single-flowered. Leaves half an inch long, linear-lanceolate, tapering at each end, very narrow, sharply serrated at the apex. Footstalks longer than the leaves. Bracteas numerous, somewhat stalked, of the shape of the leaves, surrounding the flower, which is radiated. Willd.

9. *P. laucoides*. Vahl. n. 5. t. 5. Willd. n. 7. (After magellanicus; Lamarck Dict. v. 1. 305. n. 26. Illustr. t. 681. f. 3.)—Stem leafy, single-flowered. Radical leaves elliptic-lanceolate, on long stalks; the rest sessile, clasping the stem.—Gathered at the Straits of Magellan, by Commerçon, who having marked his specimens as an *Aster*, the plant was described as such by Lamarck. The whole herb is destitute of pubescence. Stem from one to nearly two feet high, slender, quite simple, round, leafy. Radical leaves several, an inch or two long, entire, on slender, almost capillary, footstalks, three or four times their own length; those on the stem numerous, alternate, sessile, linear-lanceolate, entire, about an inch long, embracing the stem with their ovate base. Flower solitary, rather drooping, not unlike that of *P. magellanicum*, but scarcely half so large.

10. *P. squarrosum*. Vahl. n. 6. t. 6. Willd. n. 8.—Stem many-flowered. Leaves pinnatifid, with toothed bristly segments.—Gathered by Commerçon at Monte Video.

A very

A very handsome species. The *stem* is above a foot high, leafy, corymbose, hispid in the manner of the sixth species. *Leaves* sessile, two or three inches long, linear, shining, rough with minute points, deeply pinnatifid; their segments acute, toothed, each point and tooth tipped with a pale bristle: the radical leaves most numerous, somewhat stalked, their segments rather folded or imbricated. *Flowers* solitary at the top of each branch, from four to eight in all, an inch broad. *Calyx* rough, pointed, its outer leaves fringed, *Radius* purple, revolute.

11. *P. brasiliense*. Linn. Mant. 115. Willd. n. 9. Vahl n. 7.—Stem many-flowered. Leaves rough; radical ones obovate, runcinate; the rest oblong; uppermost entire.—Gathered in Brasil, by Father Panegai an astronomer, who sent it to Arduino. Commerfon also found it at Monte Video. The *root* has many thick fleshy fibres. *Herb* rough in every part, with minute bristly hairs, a foot or more in height. Radical *leaves* stalked, near three inches long, obtuse, with many shallow, runcinate, toothed segments; those on the stem sessile, oblong, undivided, the lower ones toothed, the upper gradually smaller and entire. *Flowers* four or five at the top of the stem, corymbose, the size of the last, but yellow, or pale sulphur-coloured.

12. *P. levigatum*. Berg. in Stockh. Transf. for 1772. 229. t. 7. Willd. n. 10.—Stem rather shrubby. Leaves stalked, lanceolate, entire, fringed. Flower-stalks terminal, mostly in pairs.—Native of Porto Bello. We have seen no specimen, nor even that volume of the Stockholm Transactions, in which alone this species is described.

13. *P. radiale*. Linn. Sp. Pl. 1248. Willd. n. 11. Vahl n. 8. (Inu'a Trixis; Linn. Am. Acad. v. 5. 406. Trixis n. 1; Browne Jam. 312. t. 33. f. 1.)—Stem shrubby. Leaves stalked, ovate, toothed, flat, smooth. Flowers corymbose.—Native of meadows about Kingston in Jamaica. *Browne*. Stem four or five feet high, shrubby, round, smooth; leafy. *Leaves* alternate, on short stalks, ovate, pointed, flat, smooth on both sides, three inches long, reticulated with minute veins. *Flowers* few, yellow, corymbose, at the ends of the branches, accompanied by diminished leaves. *Calyx* smooth, somewhat fringed.

14. *P. recurvatum*. Vahl n. 9. t. 7. Willd. n. 12.—Stem somewhat shrubby. Leaves linear-lanceolate, recurved, revolute, bordered with minute spines. Flowers terminal, solitary.—Gathered by Commerfon at the straits of Magellan. This seems to be a low, tufted, much branched *shrub*, with crowded, recurved, shining, linear-lanceolate leaves, an inch long, corrugated on the upper side, reflexed at the margin, the prominent edges beset with little spines. *Footstalks* broad, fringed, imbricated. Flowering *branches* terminal, erect, roughish upwards, each bearing a few alternate, fringed, clasping leaves, and one erect purple flower, about an inch wide, whose outer calyx-leaves are fringed with small spines. A very pretty and singular species, which though different in its first aspect, displays, when examined, abundant marks of affinity to the rest.

Perhaps Vahl may be right in removing *Perdicium* to the order of *Syngenesia Polygamia-aqualis*, there being, apparently, in most of the species, no more difference between the florets, than a gradual diminution as they approach the centre, like what is seen in *Hieracium* and others. In habit some of the species agree with the ligulate, others with the capitate, genera of that order. Notwithstanding all this, as the various species have not been examined living, and as Linnæus has described a difference in structure, between the florets of the radius and of the disk, we rather prefer leaving the genus where he placed it. The thirteenth spe-

cies is so different in habit, that we cannot but suspect it to belong to some other tribe. Browne's figure of the dissected flower disagrees with his description, which says the florets are all uniform. In the plate the radiant ones are as they ought to be in *Perdicium*; while the disk is made to consist of such as are equally five-cleft.

PERDIDO, in *Geography*, a river and bay on the coast of West Florida. The mouth of the river is about ten leagues E. of Mobile point and four W. of the line of Pensacola. It has a narrow entrance, with a bar of six feet, but afterwards widens considerably. This was formerly the boundary between Florida and Louisiana, separating the French and Spanish dominions, and is now considered as the eastern boundary of Louisiana, as lately ceded to the United States. The river stretches in one place N.E. where it passes within a mile of the great lagoon W. of the entrance of Pensacola harbour.

PERDIX, in *Conchology*, a name given by authors to a genus of shells, supposed to resemble the partridge in the shades and disposition of the colours.

The partridge-shell is of the dolium, or concha globosa class, and is striated and spotted in a peculiarly elegant and regular manner. See CONCHOLOGY.

PERDIX, in *Ornithology*. See TETRAO.

PERDIX *Russica*. See SCOLOPAX *Rusticola*.

PERDIX *Major Brasiliensis*. See PSOPHIA *Crepitans*.

PERDIX *Montana*. See COLUMBA *Montana*.

PERDOLI, in *Geography*, a town of Istria; four miles N.N.W. of Pola.

PERDONATIO *ut lagarie*, in *Law*, a pardon for one who is outlawed.

PERDRIX *de Mer*, in *Ornithology*. See GLAREOLA and TETRAO.

PERDU, MONT, in *Geography*, the loftiest mountain of the Pyrenées, and the most elevated in which any marine remains have been found in Europe. M. Ramond observed that this mountain was calcareous, and contained shells and other organized bodies, in a fossil state, at an elevation of about 3000 metres. As he ascended this mountain, in August 1802, by passing the Col de Fanlo, or Nifele, he constantly found strata of compact carbonated lime in a position nearly vertical. They include strata of calcareous sandstone, and these strata sometimes cover the salient angles of the vertical strata, nearly in a horizontal direction. This calcareous stone falls off spontaneously in little irregular fragments; and on the slightest friction, or dissolved in acids, it emits a nauseous fœtid smell, probably owing to the animal matter it contains. Some of the strata of this stone contain nodules of flint; others such considerable masses of "Camerines," that the stone appears entirely composed of them. The fummit is formed of a fœtid limestone, contaminated with quartz, and containing a little iron, and $\frac{1}{8}$ th of carbon, without alumine. The elevation of this fummit is the same as that of the Col du Géant in the Alps, or 3426 metres = 3727 yards.

M. Ramond has ascertained the limits of permanent snow, and of vegetation, for this lofty part of the Pyrenean chain. The snow terminates at 2440 metres. The last trees are Scotch firs, which reach 2150 metres. Next come the shrubs, of which the juniper is the highest. At 2760 metres were found the "*Ranunculus parnassie foliis*," the "*Saxifraga Groenlandica*," &c.; then the "*Artemisia rupestris*" of Lamarck; and lastly round the very peak of Mont Perdu, on rocks too sloping to retain the snow, grow the "*cerastium*," perhaps the "*alpinum*" of Linnæus, and the rose-flowering "*Aretia alpina*."

PERDUE, a soldier placed in a dangerous, and almost desperate post. Thus we say, *enfants perdus*, for the forlorn hope of an army.

The word is French, and literally signifies *lost*.

To lie *perdue*, is to lie flat on the belly, or to lie closely in wait.

PERDUE Bay, in *Geography*, a bay on the S.W. coast of the island of St. Vincent; 71 miles N.W. of Kingston bay.

PEREA, a small island near the coast of Brazil. S. lat. 2° 22'. W. long. 45° 2'.

PEREBEA, in *Botany*, Aubl. Guian. 952. t. 361. Juss. 402, a Guiana plant, whose botanical characters are not fully known. Aublet describes it as a middling-sized tree, throwing up from the root many straight flexible trunks, about four or five inches in diameter, which bear striated leafy branches. Leaves alternate, nearly sessile, elliptic-oblong, pointed, wavy and somewhat toothed, a foot or more in length, and about five inches wide, green, smooth and shining, with one principal rib, and many transverse ones. When held against the light, these leaves appear full of transparent dots. Stipules solitary, large, membranous, deciduous. Flowers axillary, on short stalks, solitary, each consisting of a flat fleshy receptacle, toothed at the edge, two inches or more in diameter, its upper surface covered with about 30 crowded florets, and at length becoming convex. Each floret consists of a tubular calyx, with four teeth, embracing a roundish germen, a fleshy columnar style, and cloven stigma. Aublet saw nothing of the stamens, which he supposes are in separate flowers, on a distinct tree. The calyx becomes a fleshy fruit, of a coral red, containing a single seed, as in the Mulberry; but each fruit falls off separate, leaving the receptacle bare. Every part of the tree yields a milky juice. The bark serves for cordage.

This genus is justly ranged by Jussieu in his natural order of *Urticæ*, being evidently allied to *Ficus*, *Morus*, *Broussonetia*, &c. See PAPIRIUS.

PERE-EN-REIZ, St., in *Geography*, a town of France, in the department of the Lower Loire, and chief place of a canton, in the district of Paimbœuf. The place contains 1973, and the canton 5988 inhabitants, on a territory of 232½ kilometres, in four communes.

PEREFIXE, HARDOUIN DE BEAUMONT, in *Biography*, a prelate and historian, descended from an ancient family in Poitou, was the son of cardinal Richelieu's maître d'hôtel. That minister took care of his education, and being brought up to the church, he was made a doctor of the Sorbonne, and preached with applause. He was chosen preceptor to the prince, afterwards Lewis XIV., and in 1654 he was admitted into the French academy. By command of the king he composed an abridgment of French history, from which he detached the life of Henry IV. which was published separately at Amsterdam in 1661, and again with augmentations at Paris the year after. Though negligently written, it is accounted an excellent work, and one which gives a better picture of that amiable monarch than the fuller history of father Daniel. It omits many circumstances of his life, the purpose being to collect those only which might serve for lessons to a great prince. This author published likewise a small piece entitled "Institutio Principis," being a plan of royal education during the period of childhood. In 1664 he was created archbishop of Paris, and had the fortune to be deeply involved in the disputes of Janseuism. He died at an advanced age in 1676. His private character has been represented as mild and amiable. Moreri.

PEREGRINARY, PEREGRINIARIUS, in the *Ancient*

Monasteries, a monk to whom was committed the care of receiving and entertaining strangers, or visitors.

PEREGRINATORRES, in *Botany*, a name for such students in that science as have taken long journies, and visited the remotest regions, in search of plants.

PEREGRINE, PEREGRINUS, a term applied among *Astrologers*, to a planet, when found in a sign where it has none of its five essential dignities.

PEREGRINUS, surnamed *Proteus*, in *Biography*, a cynic philosopher in the second century, was a native of Parium in Pontus. If we are to credit the account which Lucian has given of him, his conduct in early life was extremely profligate. Being obliged to fly from his country, he went to Palestine, where he made profession of Christianity, and gained some credit with the Christians by his firmness in submitting to imprisonment under Trajan's persecution, sooner than renounce his avowed principles. During his confinement, he was visited by the deputies from the churches of Asia, who administered to him assistance suited to his wants and sufferings, and in the character of a persecuted believer, he contrived to amass a considerable sum of money. At length he was set at liberty by the governor of Syria, who was a lover of philosophy, and admired the contempt of death which Peregrinus displayed. Upon his return to Parium, he acquired reputation in the character of a disinterested philosopher. By the charity of the Christians, whom he continued to deceive, he was furnished with all necessary supplies, till, having been detected in the commission of some crime, he was dismissed their society, and fell into indigence. He now endeavoured to recover the possession of his estates from the city, but failing in the attempt, he went into Egypt. Here, in the character of a mendicant cynic, he practised the most extravagant exploits of fanaticism, in order to shew his contempt for the opinions of the world. From Egypt he went into Italy, where he behaved extremely ill, so that he was driven away by the government. Passing over into Greece he attracted the admiration of the crowd at Athens, by the severity of his cynical manners, and the lectures which he delivered. Finding their enthusiasm in his favour becoming less ardent, he determined to procure an immortal name by burning himself at the olympic games, in imitation of Hercules. This design he announced throughout the whole of Greece, and, at the appointed time, went to Olympia, where, in the presence of a vast concourse of spectators, he raised a funeral pile, and devoted himself to a voluntary death. Such is the account given of Peregrinus by Lucian, but Aulus Gellius speaks of him as a philosopher of reputation at Athens, who was admired for his constancy, and whose moral lectures were much frequented. According to Eusebius he committed himself to the flames in the year 168. Lucian. Esfield's Hist. Phil.

PERTIRA, BARTHOLOME, a Portuguese Jesuit, and one of the many epic poets which that extraordinary society has produced. The work which he published is entitled "Paciecidas" libri xii. Coimbra 1640; it was written in honour of a Jesuit who suffered martyrdom in Japan, and to whom the poet was related. Except the names of idols, and the bronzes, there is no allusion to any rite or custom of the country. There are, however, says Mr. Southey, some curious passages in the poem, particularly a personification of Amor Vitæ, and some of real merit.

PEREIRA de Susa, in *Geography*, a town of Portugal, in the province of Beira; 18 miles S.E. of Oporto.

PEREK, a town of Persia, in the province of Farsistan; 14 miles N. of Darebghend.

PEREKOP, a fortress of Russia, in the province of Tauris,

Tauris, on the isthmus which joins the peninsula to the continent, and which has been always reckoned the key to the whole country. Its name is Sclavonian, denoting a cut made through a place, and applicable to the ditch dug here, in remote ages, across the neck of land at the entrance of the Crimea, for the security of the place. For the same reason the Greeks called it "Taphros" or "Taphraz," and the Greeks and Tartars "Or." The houses here are mean. After often changing masters, it was finally ceded, in 1783, to the Russians, with the rest of the Crimea, by the abdication of the khan. N. lat. $46^{\circ} 4'$. E. long. $33^{\circ} 20'$.

PEREKOPSKAIA, a town of Russia, in the country of the Cossacks, on the Don; 48 miles S. of Archedinskaiia.

PERELOMOV, a town of Russia, in the government of Irkutsk, on the Amor; 56 miles N.E. of Stretinsk.

PEREMSCHAL, a town of Russia, in the government of Kaluga, on the Oka; 16 miles S.S.W. of Kaluga. N. lat. $54^{\circ} 15'$. E. long. $35^{\circ} 44'$.

PEREMPTORY, in *Law*, an epithet applied to an action, exception, &c. signifying them to be absolute, final, and determinate; and not to be altered, renewed, or restrained.

Thus in our law books we find *peremptory action*, *peremptory nonsuit*, *peremptory exemption*, &c.

PERENDORE, or PERENTORAY, in *Geography*, a town of Hindoostan, in the Mysore; 10 miles S.W. of E-road.

PERENE, a river of Peru, which rises about two leagues from Tarma, runs through that town, and receives many streams from the heights of Bombon and Pasco; the Perene joins the Maranon, on the western side, at $11^{\circ} 18'$.

PERENNIAL PLANTS, in *Gardening*, are such as are of long duration. Such plants as are perpetuated by the roots, whether the leaves and stalks decay annually in winter, or always remain, provided the roots are of many years duration, are perennial. All plants, therefore, with abiding roots, both of the herbaceous, shrub, and tree kinds, are perennials; though in the general acceptance of the word perennial, it is most commonly applied to herbaceous vegetables with durable roots, more especially those of the flowery kind, which among gardeners are commonly called simply perennials, particularly the fibrous-rooted tribe; but it is equally applicable to fibrous, tuberous, and bulbous-rooted plants, whose roots are of several years duration; likewise all shrubs and trees of every denomination, as having abiding roots, are perennial plants.

And these sorts of plants consist both of deciduous and ever-green kinds; those that cast their leaves, &c. in winter being termed deciduous perennials, and those which retain their leaves, ever-greens.

The herbaceous perennials, of the fibrous, tuberous, and bulbous rooted kinds, for the greater part, have annual stalks, rising in spring, and decaying in winter; and a great many lose their leaves entirely also in that season, such as the perennial sun-flower, asters, and numerous other sorts; and many retain their leaves all the year, but not their stalks; as is exemplified in the auricula, polyanthus, some campanulas, pinks, carnations, and many other plants.

Numbers of the herbaceous perennials multiply exceedingly by off-sets of the root, by which they are readily propagated. See OFF-SET.

All the tree and shrub perennials are durable in root, stem, and branch; but renew their leaves annually. Even the ever-green kinds, although they are in leaf the year round, put forth new leaves every year, to which the old ones gradually give place. See DECIDUOUS and EVER-GREEN TREES.

PERENNIAL Winds. See WINDS.

PERES, or *Constantine Peres*, in *Geography*, an island on the coast of Chili, opposite to Port Coral. On this island is a fort called Manfera, and on the back of the island is an entrance for boats into the harbour of Valdivia.

PERESKIA, in *Botany*, received that appellation from Plumier, in honour of Nicholas Fabricius Peiresk, a magistrate of Aix in Provence, highly celebrated for his botanical learning and great love of plants. He is said to have prepared several works on natural philosophy, mathematics, and botany, whose publication was prevented by his death. The *Pereskia* of Plumier however was reduced by Linnæus to CACTUS, see that article. There are characters perhaps in the fructification sufficient to have kept it distinct, as the habit is very dissimilar.

PERESLAVALZALSKOI, in *Geography*, a town of Russia, in the government of Vladimir; 60 miles N.W. of Vladimir. N. lat. $56^{\circ} 35'$. E. long. $38^{\circ} 54'$.

PERETERION, a name given by chirurgical writers to the perforating part of the trepan.

PEREVOLOTSKAIA, in *Geography*, a fort of Russia, in the government of Upha, on the Samara; 32 miles W.N.W. of Orenburg.

PEREVOZ, a town of Russia, in the government of Niznei Novgorod; 48 miles S.S.E. of Niznei Novgorod. N. lat. $55^{\circ} 36'$. E. long. $44^{\circ} 34'$.

PEREVOZNOI, Nos, a cape of Russia, in the straits of Vaigatskoi. N. lat. $69^{\circ} 15'$. E. long. $58^{\circ} 22'$.

PEREZ, DAVID, in *Biography*, the son of Juan Perez, a Spaniard, settled at Naples, was born in 1711, and brought up in the conservatorio of Santa Maria di Loreto, in that city, under Antonio Gallo and Francesco Mancini. His progress in composition was rapid, and discovered an uncommon genius. When he quitted the conservatorio, his first preferment was at Palermo in Sicily, where he was appointed maestro di capella of the cathedral in that city, at a considerable salary, the half of which he was permitted to enjoy, not only after he quitted Sicily, but even Italy, to the time of his death.

He composed his first operas for the theatre at Palermo, from 1741 to 1748, and then returned to Naples, where his "Clemenza di Tito" was performed with such great applause at the theatre of San Carlo, as to extend his fame to Rome, whither he was invited the next year to compose for the theatre delle Dame. Here he produced "Semiramide" and "Farnace;" and for other cities in Italy "La Didone Abbandonata," "Zenobia," and "Alessandro nell' Indie."

In 1752, he went to Portugal, where he was engaged in the service of king Joseph. His first opera at Lisbon, "Demofonte," was received with very great applause. Gizziello was the principal soprano, and the celebrated Raaf the tenor. It was besides rendered magnificent in the performance by a powerful orchestra and decorations that were extremely splendid. But the new theatre of his Portuguese majesty, which was opened on the queen's birth-day, March 31st, 1755, surpassed, in magnitude and decorations, all that modern times can boast. On this occasion Perez new set the opera of "Alessandro nell' Indie," in which opera a troop of horse appeared on the stage, with a Macedonian phalanx. One of the king's riding-masters rode Bucephalus, to a march which Perez composed in the manege, to the grand pas of a beautiful horse; the whole far exceeding all that Farinelli had attempted to introduce in a grand theatre under his direction at Madrid, for the fitting out of which he had unlimited powers. Besides these splendid decorations, his Portuguese majesty had assembled together the greatest singers then existing; so that the lyric productions

of Perez had every advantage which a most captivating and perfect execution could give them.

The operas by which he acquired the greatest fame in Portugal were "Demetrio" and "Solimano," with which, as they were to be alternately performed with the operas of "Vologeso" and "Enea in Latio" that Jomelli had been requested by his most faithful majesty to compose for his theatre, were produced with a degree of exertion and emulation, which rendered him superior to himself. Jomelli on this occasion was chiefly admired for the ingenious and learned texture of the instrumental parts; and Perez for the elegance and grace of his melodies, and expression of the words.

His music for the church, of which a specimen has been printed in England, "Matutino de i Morti," published by Bremner, in score, is grave, ingenious, and expressive.

But though Perez has composed a "Te Deum," which is greatly esteemed at Lisbon, and his "Lezione prima per il Giovedì fanto," mentioned above, has considerable merit, yet it appears, on examining his scores, that this master had not, like Jomelli, much exercised his pen in the composition of fugues or learned counterpoint for the church, to the perfection of which, genius alone can contribute but little, without the assistance of great study and experience.

There is, however, an original spirit and elegance in all his productions; in which, if any defect appears, it is the want of symmetry in the phraseology of his melodies, in which there may sometimes be found what the French call *phrases manquées*, and *contre-tems*, to which critical ears, in modern times, are much less accustomed than formerly. An ear for measure, and an ear for harmony and the accuracy of tones, seem to be totally different gifts of nature; and it frequently happens that a person who dances perfectly well in time, knows not one tune or tone from another.

Perez, like Handel, was corpulent and gourmand, a propensity which has been supposed to have somewhat shortened his days. After living much admired, beloved, and respected, twenty-seven years in Portugal, where he was maestro di cappella to his most faithful majesty, and master to the royal family, at a salary exceeding 2000*l. per annum*, he died extremely regretted at the age of sixty-seven. Like Handel, he was likewise blind during the latter years of his life; but after this calamity, when confined to his bed he frequently dictated, without an instrument, compositions, in parts, to an amanuensis. His remains were deposited in the church of the Italian Barbadindros, and a solemn dirge of his own composition was performed at his funeral, by a concurrence of the best musicians in Lisbon.

PEREZ, ANTONIO, whose father was forty years sole secretary of state to Charles V. and Philip II., in which office he was succeeded by the subject of the present article, was also made secretary of war, and demeaned himself so well, as to enjoy, at the same time, the favour of the king and of the people. While in office he was commanded by the king to obtain the assassination of Don Juan de Escovedo. He unfortunately obeyed the orders of his sovereign; and supposing that the deed would be considered as a common accident, the murder was perpetrated in the streets of Madrid. Perez appears never to have suspected that he committed a very great crime. He represented Escovedo's death as necessary, and the forms of justice he thought might readily be dispensed with on extraordinary occasions. Suspicion fell on him and the princess Eboli: it had been surmised that Philip was an unsuccessful suitor to this lady, and jealous of Perez's intimacy with her. Be this, however, as it may, he took the opportunity, occasioned by the suspicion, to throw them both into prison, and suffered the accusation to

hang over the secretary's head for many years, still continuing to employ him, and promising him his protection and favour. At length he got possession of the papers which alone could have established his own share in the murder, and then suffered Antonio to be put to the rack. It was the intention of this unfortunate man to bear the tortures inflicted on him without confessing, but the violence of the pain overcame his resolution, and he declared that he had procured Escovedo's assassination, but that it was by Philip's orders. Happily for his own character, he had still by him papers sufficient to prove this, and with these he escaped to Arragon. "That kingdom," said Mr. Southey, in writing the life of Perez only a year or two since, "was still by its constitution a free country, but constitutions are nothing in the way of power, and no country has any other security for its freedom than the spirit and strength of the people." He appealed to the tribunal del justiza de Arragon, a free tribunal, to whose decision Philip did not chuse to attend, and, therefore, removed the cause to the Enquesta, a sort of star-chamber of his own, in which any wickedness that it pleased him to direct would receive the form of legality. "But," says the writer already alluded to, "the Arragonese had now espoused the cause of their injured countryman, and it was thought that the most effectual method of destroying him would be to deliver him over to the inquisition. That accursed tribunal, which had lately been established in Saragossa, laid hands on him, on a charge of witchcraft: blinded and besotted with superstition as the Arragonese were, in common with all the Spaniards, their love of liberty was not at this time to be thus betrayed. They rescued him from the holy office. In consequence of this and other tumults an army was marched into Arragon. The justiza, as he was bound to do, called upon his countrymen to resist this invasion of their rights; but he, and the nobles with him, aware of their inability to oppose veteran troops, set the example of flight. Better had it been to have died in the field, even had the cause been utterly hopeless, as he deemed it, which possibly it might not have been. He and the other chiefs were secured and beheaded. Perez made his escape into France, and the forms of liberty in Arragon were extinguished." Antonio found the protection that he implored: he published a narrative of his sufferings, and it is certain, by the great names which appear in his correspondence, that he was highly esteemed and respected both in France and England. Several unsuccessful attempts were made to murder him. He died miserably poor in the year 1611, and endured to the last the heavy affliction of being separated from his wife and children. No interest could avail to procure their liberation, and he imputes the death of his eldest daughter to grief on his account. Gen. Biog.

PERFECT, something to which nothing is wanting; or that has all the requisites of its nature and kind.

PERFECT, *Perfecti*, in *Church History*, a designation which the followers of Valentinus assumed to themselves.

PERFECT, in *Grammar*. Preter or preterit-perfect tense, is an inflection, marking a time perfectly past; as *I have heard*: plusquam-perfect, is an inflection, expressing the time more than perfectly past; as *I had heard*, &c. See TENSE.

PERFECT, in *Music*, denotes something that fills and satisfies the mind, and the ear. In which sense we say, perfect cadence, perfect concord, &c.

The ancients had two kinds of modes, the major and minor; and each of these, again, was either *perfect* or *imperfect*.

The word *perfect*, when joined by the words *mode* and *time*, usually expresses triple time, or measure; in opposition

position to double time, which they call *imperfect*. See TIME.

PERFECT, in *Physiology*. A perfect animal is used, by some writers, for that which is born by univocal generation; in opposition to insects, which they pretend to be produced by equivocal generation.

PERFECT Flowers, in *Botany*, and *Vegetable Physiology*, are such as have the flamens and pistils both perfect in the same flower. They are the *flores hermaphroditi* of Linnæus, and are sometimes called *united flowers*.

PERFECT Mixts. See MIXTS.

PERFECT Number, in *Arithmetic*, is one that is equal to the sum of all its divisors, or aliquot parts (Euclid, book vii. def. 22): thus,

$$6 = \frac{6}{2} + \frac{6}{3} + \frac{6}{6}$$

$$28 = \frac{28}{2} + \frac{28}{4} + \frac{28}{7} + \frac{28}{14} + \frac{28}{28}$$

are both perfect numbers.

To find Perfect Numbers — Find $2^n - 1$, a prime number, then will $2^{n-1}(2^n - 1)$ be a perfect number: for $2^n - 1 = 1 + 2 + 2^1 + 2^2 + 2^3 + \&c. 2^{n-1}$; and it is demonstrated by Euclid, in the last proposition of book ix, that if the above series be continued till the sum be a prime, then that sum multiplied by the last term of the series will be a perfect number, which, therefore, is identically the same as the above formula, and the truth of the theorem under its analytical form may be demonstrated as follows. Since $2^n - 1$ is a prime, put it = b , and $2^{n-1} = 2^m = a^m$, then the above is reduced to $a^m b$.

Now the sum of the divisors of $a^m b = \frac{a^{m+1} - 1}{a - 1} \times \frac{b^{1+1} - 1}{b - 1}$. See NUMBERS.

But in this formula the number itself is considered as a divisor, which is excluded in perfect numbers; therefore the sum of the divisors, exclusive of the number itself, is

$$\frac{a^{m+1} - 1}{a - 1} \times \frac{b^{1+1} - 1}{b - 1} a^m - b;$$

and it only remains to be shewn that this is equal to $a^m b$, or that

$$\frac{a^{m+1} - 1}{a - 1} \times \frac{b^{1+1} - 1}{b - 1} = 2 a^m b :$$

and this will be obvious by re-establishing again the values of

a and b , as above: for then $\frac{2^n - 1}{2 - 1} \times \frac{(2n - 1)^2 - 1}{(2n - 1) - 1} = (2^n - 1)(2^n - 1 + 1) = 2^n(2^n - 1)$, and $2 a^m b = 2 \cdot 2^{n-1}(2^n - 1) = 2^n(2^n - 1)$, which are identical.

Consequently, every number of the form $2^{n-1}(2^n - 1)$ when the latter factor is a prime, is a perfect number, the sum of its divisors being equal to the number itself.

- If $n = 2$ then $2(2 - 1) = 6$
- $n = 3 - 2^2(2^3 - 1) = 28$
- $n = 5 - 2^4(2^5 - 1) = 496$
- $n = 7 - 2^6(2^7 - 1) = 8128$
- $n = 13 - 2^{12}(2^{13} - 1) = 33550336$
- $n = 17 - 2^{16}(2^{17} - 1) = 8589869056$
- $n = 19 - 2^{18}(2^{19} - 1) = 137438691328$
- $n = 31 - 2^{30}(2^{31} - 1) = 2305843008139952128$

which are all the perfect numbers at present known.

The difficulty, therefore, of finding perfect numbers arises out of that of finding prime numbers of the form $2^n - 1$,

which is a very laborious operation. Euler ascertained that $2^{31} - 1 = 2147483647$ is a prime number, and this is the greatest at present known to be such, and consequently the last of the above perfect numbers, which depends upon it, is the greatest perfect number at present known, and in all probability the greatest that ever will be known; for being merely matters of curiosity, it is not likely that any one will ever attempt to find one beyond it. See Barlow's Theory of Numbers.

PERFECT Plants. See PLANTS.

PERFECTION, the state or quality of a thing perfect. This is of divers kinds: *physical*, *moral*, and *metaphysical*.

PERFECTION, *Physical*, or *Natural*, is that by which a thing has all its powers or faculties, and those too in their full vigour; and all its parts both principal and secondary, and those in their due proportion, constitution, &c. In which sense a man is said to be perfect, when he has a sound mind in a sound body.

This perfection is by the schoolmen frequently called *επεξετησιον*, because a thing is thus enabled to perform all its operations.

PERFECTION, *Moral*, is an eminent degree of virtue, or moral goodness; to which men arrive by often repeated acts of piety, beneficence, &c.

This some subdivide into *absolute* or *inherent*, which is actually in him to whom we attribute it; and *imputative*, which exists in some other, and not in him to whom it is attributed.

PERFECTION, *Metaphysical*, or *Transcendental*, or *Essential*, is the possession of all the essential attributes, or of all the parts necessary to the integrity of a substance: or it is that by which a thing has, or is provided of, every thing belonging to its nature.

This is either *absolute*, where all imperfection is excluded; such is the perfection of God: or *secundum quid*, and in its kind.

PERFECTISSIMATE, PERFECTISSIMATUS, a quality, or dignity, mentioned in the Code. Perfectissimi were those to whom the emperors trusted the presidentship of any province. Alciat imagined the name had been only given to the governors of Hispânia Tarraconensis, and Noricum; but Calvin has shewn the contrary in his *Lexicon Juridicum*.

The perfectissimi were inferior to the clarissimi, though the former word imply most perfect.

PERFETTO, as in the old time-table, when *perfetto* implied triple time, *consonanza perfetta*, a perfect concord.

PERFIDE, in *Italian Music*, implies a certain tendency to repeat the same thing, as in *Rosalie*, to repeat the same passages, or pursue the same design, persist in the same movement, the same character of air or melody, the same passages in the same kind of notes. (See CHANT, DESIGN, and MOVEMENT.) Such are the ground bases, in chacones, and an infinite number of constrained accompaniments, or *perfidii*, or *perfidiatii*, which depend on the caprice of the composers.

PERFOLIATA FOLIA, in *Botany*, Perfoliate Leaves, are such as have the stem or branch running through them, as in *Bupleurum perfoliatum*, thence termed *Thorough-wax*, from the old word *wax*, to grow. See LEAF.

PERFORANS, PERFORATUS, in *Anatomy*, two muscles of the fingers, called also *flexor digitorum profundus* and *sublimis*. See FLEXOR.

PERFORANS *Gasserii*, a name given to the external cutaneous nerve of the arm, which penetrates the coraco-brachialis

chialis muscle, from an Italian anatomist who described it. See NERVE.

PERFORATA, in *Botany*, a name given by some authors to the *hypericum*, or St. John's wort, from the small holes seen all over its leaves, if held up to the light.

PERFORATIVE. See TREPANUM.

PERFORATOR, in *Midwifery*, an instrument used to open the heads of children, when from some error, or defect in the pelvis of the mother, it is impossible to bring them through without mutilating them. (See LABOUR, *Difficult*.) The perforator introduced by Smellie, and which is now generally used, is that of a pair of scissors, or an instrument formed like scissors, on a large scale, viz. about thirteen inches in length, and of proportionate thickness, with the edges rounded, that they may not cut, and with a guard, or projection on each blade, about three inches from the points, to prevent their entering farther than is necessary into the skull of the child. Having pushed the perforator through one of the parietal bones of the head of the child, or through a suture, if one can be found, (see LABOUR, *Difficult*,) until stopped by the guard, the handles must be opened, and the instrument turned round, by which means the aperture in the skull will be enlarged, in every direction, when the perforator may be withdrawn. See the figure.

PERFUME, an agreeable artificial odour, striking the sense, or organ of smelling.

Perfumes are generally made or composed of musk, ambergris, civet, rose, and cedar-woods, orange-flowers, jasmijn, jonquil's, tuberoses, and other odoriferous flowers.

Into these also enter storax, frankincense, benzoin, cloves, mace, and other like drugs, commonly called *aromatics*. Some perfumes are also composed with aromatic herbs, or leaves, as lavender, marjoram, sage, thyme, hyssop, &c.

Perfumes were anciently much in use, particularly those into which musk, ambergris, and civet enter; but they are now generally disused, since people have become sensible of the harm they do to the head. In Spain and Italy, however, they are still very common.

PERFUMES, *Suffitus*, in *Pharmacy*, &c. are topical or external medicines, composed of certain powders and gums, which, being mixed together, and thrown on the coals, produce a vapour or smoke, salutary in the several diseases. See SUFFITUS.

Burnt mercury is sometimes applied by way of suffitus, called fumes of cinnabar.

There are dry perfumes, made up in troches, pills, &c. of olibanum, mastic, aloes, &c. and moist viscous ones mixed with the juices of herbs, &c.

PERG, in *Geography*, a town of Austria; 6 miles S.S.E. of Aigen.—Also, a town of Austria; 12 miles E. of Steyregg.

PERGA, in *Ancient Geography*, a town of Asia Minor, in the interior of Pamphylia, between the rivers Cestros and Cataractes.

PERGA, or *Parga*, in *Geography*, a town of Albania, on the coast of the Adriatic; 25 miles W.N.W. of Arta.

PERGAMAR, a town of European Turkey, in Rumania; the see of a bishop; 60 miles S.W. of Adrianople.

PERGAMO, a town of Asiatic Turkey, in Natolia, situated at the foot of a mountain, on a river formerly called "Caicus," with a harbour about 15 miles from the sea; inhabited chiefly by Turks, with some Christians, who have a church, and are poor; 144 miles S.S.W. of Constantinople. N. lat. 39° 11'. E. long. 27° 0'.

PERGAMUS, in *Ancient Geography*, (now *Pergamo*.) a town of Mysia, seated on a spacious plain on the banks

of the Caicus. The territory of this town was watered by two rivers, one of which traversed the town, and the other ran S.W. of it at a little distance. This territory was pleasant and fertile; and the town was built at the foot of a rock, in the form of a cone, upon which was a fortified castle, where the ancient kings deposited their treasures. The inhabitants of this city pretended to be descendants of the Arcadians, who arrived in this part of Asia with Telephus, son of Hercules; and they say that Esculapius came to Pergamus with a learned colony of Greeks, and practised medicine in this place. The Pergamenians paid him great honours, calling him by the titles of god the saviour, and the sovereign god. They constructed for him a magnificent temple, in which they offered sacrifices, and they celebrated in honour of him public games. The temple was visited by all the people of Asia Minor, and thus Pergamus became famous: the worship of this god continued in it till the establishment of Christianity. Pergamus was at first governed by its own magistrates, who were independent of any other power. It was afterwards under the dominion of the kings of Lydia, from whom it was transferred to the kings of Persia. After the death of Alexander it was subject to Antigonus, and at his death it was transferred to Lysimachus, one of the successors of Alexander, according to Strabo. This prince deposited his treasures in the castle, and entrusted the custody of them to Phileteus of Thios, who fortified the castle and laid the foundation of the kingdom of Pergamus, which lasted 153 years. Eumenes, one of the kings of Pergamus, enlarged and embellished this city. He enriched it with a library containing 200,000 choice volumes, for the transcribing of which parchment was here first invented, and thence called by the Latins *Charta Pergamena*. In Pergamus were likewise invented those costly hangings, which we call tapestry, and which the Romans named "Aulæa," from *aula*, a hall, because the hall of Attalus, who invented them, was the first room adorned with this furniture. Galen was born in this city. At Pergamus was one of the seven churches mentioned in the Revelation. Attalus III., surnamed Philometer, having no children, bequeathed his estates to the Romans, A. U. C. 621. Arilonicus, the natural son of Eumenes II, contended the kingdom of Pergamus with the Romans, but after different events, he was made a prisoner and conducted to Rome. The kingdom of Pergamus was reduced to a Roman province, and bore the name of "Proconsular Asia." In process of time, however, it was dismembered from it. Under the Romans the government of Pergamus was democratic, conducted by a council appointed by the people, under the direction and superintendance of a magistrate, who was president and who was chosen annually. Pallas, Hercules, and Jupiter were divinities held in great respect at Pergamus; but the most celebrated was Esculapius; and Apollo, who was regarded as his father, received singular honours at Pergamus. Trajan had divine honours at Pergamus; and both the gods and the emperors had temples here, the most considerable of which was that of Esculapius. The temple of Augustus in this city was constructed at the expence of the province of Asia; the pagoda had eight columns, and is represented on many medals. This city celebrated, with a magnificence that was very expensive, the Olympic, Pythic and Actian games, and also others in honour of Esculapius and the emperors. These games were preceded by solemn sacrifices. There were many persons at Pergamus, who conducted the offices of religion, the chief of whom bore the name of pontiff or chief priest. The "Nicephorium," or wood consecrated to Jupiter, was held in high veneration. This city accumu-

lated great wealth by industry, by the commerce of parchment, and by the fabric of stuffs and tapestry.

It is now an inconsiderable place, thinly inhabited. In the neighbouring fields may still be found the ruins of the palace of the Attalic kings, an aqueduct and a theatre.

PERGKIRCHEN, in *Geography*, a town of Austria; 11 miles E. of Steyregg.

PERGOLA, a town of the duchy of Urbino; 8 miles E. of Cagli.

PERGOLESI, GIOVAN BATTISTA, in *Biography*, a gifted musician, born at Casoria, a little town about ten miles from Naples, in 1704. His friends discovering, very early in his infancy, that he had a disposition for music, placed him in the conservatorio at Naples, called Dei poveri in Gesu Cristo, which has been since suppressed. Gaetano Greco, of whom the Italians still speak with reverence as a contrapuntist, presided then over that celebrated school. This judicious master soon perceiving uncommon genius in his young pupil, took particular pleasure in facilitating his studies, and communicating to him all the mysteries of his art. The progress which the young musician made was proportioned to the uncommon advantages of nature and art with which he was favoured; and at a time when others had scarcely learned the gamut, he produced specimens of his abilities which would have done honour to the first masters in Naples. At the age of fourteen, he began to perceive that taste and melody were sacrificed to the pedantry of learned counterpoint, and after vanquishing the necessary difficulties in the study of harmony, fugue, and scientific texture of the parts, he intreated his friends to take him home, that he might indulge his own fancies, and write such music as was most agreeable to his natural perceptions and feelings.

The instant he quitted the conservatorio, he totally changed his style, and adopted that of Vinci, of whom he received lessons in vocal composition, and of Haffe, who was then in high favour. And though he so late entered the course which they were pursuing with such rapidity, he soon came up with them; and, taking the lead, attained the goal, to which their views were pointed, before them. With equal simplicity and clearness, he seems to have surpassed them both in graceful and interesting melody.

His countrymen, however, were the last to discover or allow his superiority, and his first opera, performed at the second theatre of Naples, called "Dei Fiorentini," met with but little success. The prince of Stigliano, first equerry to the king of Naples, discovering, however, great abilities in the young Pergolesi, took him under his protection; and from the year 1730 to 1734, by his influence, procured employment for him at the Teatro Nuovo. But during this period, the chief of his productions were of the comic kind, and in the Neapolitan dialect, which is unintelligible to the rest of Italy, except the "Serva Padrona," set for the theatre of San Bartolomeo.

It was not till the year 1735, that an account of his merit penetrated so far as Rome, and inclined the directors of the opera there, to engage him to compose for the Tordinona theatre in that city.

Pergolesi, ambitious of writing for a better theatre, as well as for better performers, than those for which he had hitherto been employed; and happy in having the exquisite poetry of Metastasio's *Olimpiade* to set, instead of the Neapolitan jargon, went to work with the zeal and enthusiasm of a man of genius, animated by hope, and glowing with an ardent passion for his art.

The Romans, however, by some unaccountable fatality, received his opera with coldness; and the composer being a

young man but little known, they seemed to want to be told by others that his music was excellent, and would soon, by the admiration of all Europe, make them ashamed of their injustice and want of taste.

To complete his mortification at the ill reception of this opera, "Nerone," composed by Duni, the next that was brought on the stage, and for which his was laid aside, had a very great success.

Duni, a good musician, and a man of candour, though greatly inferior in genius to Pergolesi, is said to have been ashamed of the treatment which he had received; and with an honest indignation declared, that he was out of all patience with the Roman public, "frenetico contro il pubblico Romano." He even tried during the short life of this opera, to make a party in its favour among the professors and artists who were captivated with the beauty of the music; but all their efforts were vain; the time was not yet come when judgment and feeling were to unite in its favour.

Pergolesi returned to Naples with the small crop of laurels which had been bestowed on him by professors and persons of taste, who in every country compose but a very inconsiderable part of an audience. He was, indeed, extremely mortified at the fate of his opera, and not much disposed to resume the pen, till the duke of Matalon, a Neapolitan nobleman, engaged him to compose a mass and vespers for the festival of a saint at Rome, which was to be celebrated with the utmost magnificence.

Though Pergolesi had but too much cause to be dissatisfied with Roman decrees he could not decline the duke's proposition, and it was on this occasion that he composed the "Mass, Dixit, et Laudate," which have been since so often performed for the public, and transcribed for the curious. They were heard for the first time in the church of San Lorenzo in Lucina, with general rapture; and if any thing could console a man of genius for such unworthy treatment as he had lately experienced at Rome, it must have been such hearty and unequivocal approbation as he now received in the same city.

His health, however, daily and visibly declined. His friends had perceived, by his frequent spitting of blood, for four or five years before this period, that he was likely to be cut off in his prime; and his malady was still increased by this last journey to Rome. His first patron, the prince of Stigliano, who had never ceased to love and protect him, advised him to take a small house at Torre del Greco, near Naples, on the sea-side, almost at the foot of mount Vesuvius. It is imagined by the Neapolitans, that persons afflicted with consumptions are either speedily cured, or killed, in this situation.

During his last sickness, Pergolesi composed his celebrated cantata of Orpheus and Euridice, and his "Stabat Mater," at Torre del Greco, whence he used to go to Naples from time to time to have them tried. The "Salve Regina," which is printed in England, was the last of his productions, and he died very soon after it was finished, in 1737, at the age of 33!

The instant his death was known, all Italy manifested an eager desire to hear and possess his productions, not excepting his first and most trivial farces and *intermezzi*; and not only lovers of elegant music, and curious collectors elsewhere, but even the Neapolitans themselves, who had heard them with indifference during his lifetime, were now equally solicitous to do justice to the works and memory of their deceased countryman. Rome, sensible now of its former injustice, as an *amende honorable*, had his opera of *Olimpiade* revived; an honour which had never been conferred on any

composer of the 18th century. It was now brought on the stage with the utmost magnificence, and that indifference with which it had been heard but two years before, was now converted into rapture.

Pergolesi's first and principal instrument was the violin, which was urged against him, by envious rivals, as a proof that he was unable to compose for voices. If this objection was ever in force with reasonable and candid judges, it must have been much enfeebled, not only by the success of Pergolesi in vocal compositions, but by Sacchini, whose principal study and practice, during youth, were likewise bestowed on the violin.

It was the opinion of the Hon. Horace Walpole, afterwards earl of Orford, that Mr. Gray first brought the compositions of Pergolesi into England. His opera of *Olimpiade* was first performed on our stage in 1742, when Monticelli acquired uncommon applause in the air, "Tremende oscuri atroce," and the scene where the "aria parlante: Se cerca se dice" occurs; which, though it has often been set since to more elaborate and artificial music, its effect has never been so truly dramatic; all other compositions to those words are languid on the stage, and leave the actor in too languid a state for his situation. When we mentioned this opinion to Pacchierotti, in a conversation on the subject, he very well applied our English vulgar phrase to Pergolesi, by saying, "He had hit the right nail on the head."

The words "Tremende oscuri atroce," are not Metastasio's, nor have we ever been able to discover whose they are, or how they happened to be set by Pergolesi; the air, however, "A due cori," is admirable.

From all the information which we were able to procure at Rome and Naples, concerning the premature death of Pergolesi, there does not seem the least foundation for the story concerning his having been poisoned. The disease of which he died was a consumption, that preyed upon his lungs during the last five or six years of his existence, and the most active and important of his life. As envy was said to have stimulated his concurrents to have recourse to poison in order to get rid of so formidable a rival, it has been well observed, that the success of Pergolesi's productions was never sufficiently brilliant to render him such an object of envy to his brethren as to make it necessary to dispatch him by unfair means. Mem. sur la Vie et les Ouvrages de Pergolesi, par M. Boyer, Mercure de France pour Juillet, 1772, p. 191.

The art of music, however, did not die with Pergolesi, as may be seen by the list of his successors, who, pursuing the track which Vinci, Haffé, and Pergolesi first had traced out, have advanced into new regions of invention, taste, grace, elegance, and grand effects.

We were assured at Rome, by a musician who had known Pergolesi personally, that he was a slow workman; "but the gods sell to mortals," says Epicharmus, "all that is great and beautiful at the price of immense labour;" *παντα χαλπιπα τα καλα*.

Salvini tells us that the celebrated composer Carissimi, being praised for the grace and ease of his melodies, used to cry out: "Ah! with what difficulty is this ease required!" *Ah! questo facile, quanto è difficile!*

He had perhaps more energy of genius, and a finer taste, than any of his predecessors: for though no labour appears in his productions, even for the church, where the parts are thin, and frequently in unison, yet greater and more beautiful effects are often produced in performance than are promised in the score. And, indeed, it frequently happens, that a score in which the texture of the parts is very ar-

tificial, ingenious, and amusing to the eye, affords nothing but noise and confusion to the ear. As the Italians in the sixteenth century were the masters to all Europe in elaborate composition, even to a pedantic excess, so they have been the first, in modern times, to abjure its absurdity.

The ease and simplicity of Vinci's and Pergolesi's style, were soon imitated with servility by men of no genius, who always appear more contemptible in light than laboured strains; and these, pushing facility to an insipid excess, soon rendered opera music proverbially flimsy and frivolous. Of this number were Lampugnani, Pescetti, Pelegrini, Giacomelli, Paleazzi, Schiassi, Pampani, and many others.

The church music of Pergolesi has been censured by his countryman, Padre Martini, as well as by some English musical critics, for too much levity of movement, and a dramatic cast, even in some of his slow airs; while, on the contrary, Eximeno says, that "he never heard, and perhaps never shall hear, sacred music accompanied with instruments, so learned and so divine, as the *Stabat Mater*."

As the works of this master form an era in modern music, and as general praise and censure is seldom just and satisfactory to discriminating minds, it was our intention to have inserted here some critical remarks resulting from a late careful examination of his principal productions for the church; but upon calculating the business which we have still on our hands before we arrive at the end of the gigantic labour which we have, perhaps, too rashly undertaken; we find that critical discussion must give way to matters of fact, or our volumes will be rendered too numerous or too unwieldy.

Of the sonatas ascribed to Pergolesi, for two violins and a base, if they are genuine, which is much to be doubted, they will not bear comparison with the bold, varied, and elegant compositions of Boccherini, Haydn, Mozart, and Vanhal. They are composed in a flimsy style, which was worn out when Pergolesi began to write; at which time another was forming by Tartini, Veracini, and Martini of Milan, which has been since polished, refined, and enriched with new melodies, harmonies, modulation, and effects.

No fair and accurate judgment can be formed of the merit of a composer of past times, but by comparing his works with those of his predecessors and immediate competitors. The great progress that has been made in instrumental music, since the decease of Pergolesi, will not diminish his reputation, which was not built on productions of that kind, but on vocal compositions, in which the clearness, simplicity, truth, and sweetness of expression, justly entitle him to supremacy over all his predecessors and contemporary rivals, and to a niche in the temple of Fame, among the great improvers of the art, who, if not the founder was the principal polisher of a style of composition both for the church and stage, which has been constantly cultivated by his successors, and which at the distance of 70 years from the short period in which he flourished, still reigns throughout Europe.

PERGUBA, in *Geography*, a town of Russia, in the government of Olonetz; 64 miles N. of Petrozavodsk.

PERGULARIA, in *Botany*, so called from *pergula*, a balcony, or trellis, in allusion to its twining habit and fragrant blossoms, which render this genus very desirable for bowers. Rumphius first gave the name of *Flos pergularis* to the Linnæan *Pergularia glabra*, which however does not answer to the generic character, and is established by Mr. Brown as a distinct genus, under the appellation of *Vallaris*, adopted from Burmann's Fl. Ind. 51. The true Linnæan *Pergularia* is founded on our first species, hereafter described. Linn. Mant. 8. Brown Asclep. in Tr. of Wern. Soc. v. 1.

31. Ait. Hort. Kew. v. 2. 83. Schreb. 167. Willd. Sp. Pl. v. 1. 1247. Juss. 146. Lamarck Illustr. t. 176?—Clafs and order, *Pentandria Digynia*. Nat. Ord. *Contortæ*, Linn. *Apocineæ*, Juss. *Aſclepiadeæ*, Brown.

Gen. Ch. Cal. Perianth inferior, of one leaf, in five erect, acute, permanent ſegments. Cor. of one petal, ſalver-shaped; tube inflated, various in length; limb in five oblong, horizontal, ſlightly twisted ſegments. Crown of the ſtamens of five compressed erect leaves, undivided at the ſummit, concave at the back, furniſhed with the pointed appendage at the inſide. Neſtary a row of glands round the baſe of the germen. Stam Filaments five, oblong, dilated, flat, cloven at the top and bottom; anthers ſeffile, membranous, of two cells; maſſes of pollen erect, ſtalked, ſoon depoſited in pairs on the glands of the ſtigma. Piſt. Germens two, ovate; ſtyles very ſhort; ſtigma common to the two, conical, obtuſe, downy, with five lateral glands receiving the maſſes of pollen. Peric. Follicles two, ovate, ſmooth. Seeds numerous, comole.

Eff. Ch. Corolla contorted, ſalver-shaped; its tube inflated. Crown of five compressed undivided leaves, with an internal appendage. Anthers ſurmounted by a membrane. Maſſes of pollen ten, ſmooth, erect. Stigma pointleſs. Follicles inflated.

1. *P. oſoratiffima*. Sweet Green Pergularia, or Chineſe Creeper. Sm. Ic. Piſt. t. 16. Andr. Repof. t. 185.—Leaves heart-shaped, pointed, rather downy. Panicles axillary. Calyx ſhorter than the tube of the corolla. Sir Joſeph Banks is ſaid to have ſent this to Kew about the year 1784. It is cultivated in China, as a favourite bower plant, though of what precise country a native is not known. We have been told it is wild in Sumatra. The late Lady Amelia Hume received a fine plant of this ſpecies in 1789, which covered the ſtern of the ſhip with its fragrant green bloſſoms, during a great part of the voyage, and has ſince been widely propagated in this country. It thrives either in a ſtove or warm conſervatory, flowering throughout the ſummer and autumn, and exhaling, in an evening, that peculiar, light, lemon-like, but luſcious fragrance, of which the Chineſe are ſo fond, and which belongs to various greeniſh night-ſcented flowers, as the *Chloranthus inconſpicuus*, and ſome *Orchidææ*. The root is branched, widely ſpreading. Stem ſhrubby, round, branched, twining and climbing to a great extent; downy when young; the bark ſpongy and cracked when old. Leaves oppoſite, ſtalked, deflexed, heart-shaped, rather taper-pointed, entire, opaque, veiny, downy at the veins and margin, paler beneath, each two or three inches long. *Stipulas* none, but the *footſtalks*, much ſhorter than the leaves, are glandular at their ſummit, as well as on each ſide at the baſe. *Panicles* axillary, ſolitary, drooping, forked, many-flowered, downy. *Bractææ* lanceolate, at each diviſion of the panicle. *Flowers* the ſize of a primroſe, pale yellowiſh-green, bearded within, their ſegments linear-oblong, oblique, the length of the tube, fringed.

Linnaeus had in his herbarium a Chineſe ſpecimen of this plant, marked *toncatofa*, with a note at the back ſignifying that the Catholic clergy at Macao prepare, from its milky juice, a medicine for the dyſentery. He cultivated the ſame in his ſtove, and deſcribed it in his *Mantiſſa*, 53. The name and ſpecific character however do not apply to this, but to a very different plant, Forſkall's *Aſclepias cordata*. Flos ſiamicus, Rumph. Amb. aëtuar. v. 7. 58. t. 26. f. 1, ſeems to be intended for our preſent ſpecies; though *Cynanchum odoratiſſimum*, of Loureiro, by the deſcription of the yellow flowers, probably belongs rather to the following.

2. *P. minor*. Sweet Yellow Pergularia, or Weſt-Coaſt

Creeper. Andr. Repof. t. 184. Curt. Mag. t. 755. (*Cynanchum odoratiſſimum*; Lonreir. Cochinch. 166?)—Leaves heart-shaped, obtuſe with a point. Panicles axillary. Calyx nearly as long as the tube of the corolla.—Native of the Eaſt Indies, where it is cultivated for the ſame reaſon as the foregoing. By dried ſpecimens, we could hardly diſcern any ſpecific difference between theſe two plants, but when compared alive, they appear to be diſtinct ſpecies. Beſides what is noted in the ſpecific character, the preſent is rather ſmaller in all its parts, with fewer flowers in each panicle. The *corolla* has broader and blunter ſegments, of a tawny yellow on their upper ſurface, though not ſo round and orange-coloured as Mr. Andrews exhibits them. *P. minor* was introduced into England by ſir Joſeph Banks in 1784, and blooms in a ſtove all ſummer long.

3. *P. purpurea*. Purple Pergularia. Vahl. Symb. v. 3. 44. Willd. n. 4. (*Aſclepias cordata*; Burm. Ind. 72. t. 27. f. 2.)—Leaves heart-shaped, taper-pointed, ſmooth. Panicles terminal. Calyx much ſhorter than the tube of the corolla.—Native of Java. We know it but from Burmann's work. He ſays the *ſtem* is erect, and *flowers* purple, in terminal umbels or panicles. Mr. Brown has not examined the fruſtification of this or the following, and merely ſays they “may belong to *Pergularia*.”

4. *P. japonica*. Japan Pergularia. Thunb. Jap. 111. Willd. n. 5.—Leaves heart-shaped, ſmooth. Umbels ſimple, axillary. Calyx longer than the tube of the corolla.—Gathered by Thunberg near Nagafaki in Japan, flowering in Auguſt. *Stem* twining, ſimple, ſmooth. *Leaves* acute, ribbed, an inch long. *Footſtalks* ſhorter, ſmooth. *Umbels* erect. *Stigma*, according to Thunberg, terminating in a long, erect, white, wavy, tapering thread, the length of the *corolla*, which is rather contrary to the generic character.

Another ſpecies may be found in Willdenow, *P. edulis*, Thunb. Prodr. 38, diſcovered at the Cape of Good Hope, and ſaid to have an herbaceous *ſtem*, with ovate *leaves*. Of this we know nothing. Mr. Brown excludes it.

PERHAY, POINT DE, in *Geography*, a cape on the W. coaſt of France; 6 miles S.E. of Point St. Matthew.

PERHO, a town of Sweden, in the government of Waſa; 56 miles E. of Jacobſtad.

PERI, JACOPO, in *Biography*, a native of Florence, the principal inventor of recitative, and the compoſer of “*Euridice*,” written by Rinuccini, the *fiſt opera* that was compoſed in *ſtilo rappreſentivo*. This drama, written and ſet to a new ſpecies of muſic for the royal nuptials of Mary of Medicis with Henry IV. of France in 1600, was publicly exhibited at Florence in the moſt ſplendid manner, and in which Peri, the compoſer, performed a vocal part.

Peri is ſaid by Battiſta Doni to have been not only a good compoſer in the new ſtyle, but a famous ſinger and performer on keyed inſtruments.

PERIA, in *Geography*, a town of Perſia, in the province of Irac; 90 miles W. of Iſpahan.

PERIAC, a town of France, in the department of the Aude, celebrated for its ſalt works; 6 miles S.W. of Narbonne.

PERIACULTUM, a town of Hindooſtan; 30 miles S.S.W. of Dindigul.

PERIADA, in *Ancient Geography*, a town of Greece, in the iſle of Eubœa. Strabo.

PERIAGOGE, περιγογη, in *Rhetoric*, the ſame with peribole.

PERI-AGRARUM, in *Geography*, a town of Hindooſtan, in Coimbatore; three miles W.N.W. of Erroad.

PERIAGUA, in *Sea Language*, a ſort of large canoe, uſed

uled in the Leeward islands, South America, and the gulf of Mexico.

This is composed of the trunks of two trees hollowed and united together; and thus differs from the canoe, which is formed of one tree. See *BOAT*.

PERIAMMA, a word used by some medical writers to express an amulet.

PERIAMOODY, in *Geography*, a town of Hindoostan; 30 miles W.S.W. of Dindigul.

PERJAN, a town of Grand Bucharia; 34 miles E.S.E. of Anderab.

PERIANDER, in *Biography*, a tyrant of Corinth and Corcyra, was the son of Cypselus, who before him had obtained an unjust authority over his fellow-citizens. Perian-der succeeded him about the year B.C. 628, and in order to secure his power put to death the principal persons in Corinth. In almost every other respect he well merited the title of tyrant, which has ever been attached to his name; but he was very inimical to that luxury which involved the inhabitants of the city, and he kept the country in peace by means of his fleet which gave him the controul of the sea. He is also applauded for not having imposed taxes upon his people, excepting those which resulted from the export and import of merchandize. His private life was stained with enormous crimes, with a detail of which we will not fully our pages. He banished his son Lycophon to Corcyra, for shewing an abhorrence of the cruelty inflicted on his mother, but in his old age he sent to recall him, in order to govern Corinth in his stead, while he himself intended to retire to Corcyra. The people of that island prevented the exchange by putting the prince to death. Periander took a just and ample revenge on the savage perpetrators of the deed; but not contented with this, he indulged the most cruel resentment on the innocent, by sending three hundred youths of the best families to be made eunuchs by king Alyattes of Sardis. These victims to royal madness, stopping by the way to Samos, were rescued by the people, and it has been asserted that the chagrin occasioned to Periander by the disappointment, caused his death, at the age of 80, in the year B.C. 584. He was a man of great talents, and an inscription on his tomb at Corinth, preserved by Laertius, proves that his country regarded him as a wife and able ruler. He was traditionally reckoned among the seven wise men of Greece, and some of his maxims, which are rather prudential than moral, seem to justify the title. The maxim most known is, "There is nothing which prudence cannot accomplish."

PERIANTH, *PERIANTHIUM*, in *Botany*, from *περι*, about, and *ανθος*, a flower, is the most usual sort of *CALYX*, see that article, which is immediately contiguous to, or more properly makes a part of, the flower. Such are the five green leaves, with their urn-shaped base, in the rose; and the tubular cup of a pink, including the scales at its base. In this last instance the perianth may be called double; and is avowedly so in most of the mallow tribe, while in the scabious it is triple. When the term calyx is used without any particular explanation, it means a perianth.

This part is either deciduous, as in the poppy, or permanent, as in the pink. In many instances it becomes enlarged, thickened, or hardened, crowning or enveloping the fruit. Its situation is either *inferior*, below the germen, or *superior*, above that part. The petals and stamens are sometimes inserted into it, as in the strawberry. (See *PERIGYNOUS Insertion*.) Its forms are infinitely various, on which the characteristic distinctions of many genera depend. In some instances it is divided, more or less deeply,

in others undivided; in some it is of one leaf, in others of several. Its form is either regular or irregular; its divisions equal or unequal. Compound flowers have a common perianth. The hue of the part in question is usually green; but not unfrequently otherwise, in which last case only it is technically said to be coloured. Many flowers have no perianth, as the tulip, which is destitute of any calyx at all; and the narcissus, which has another kind of calyx, the sheath, or *spatha*. Some, as the umbelliferous tribe and the genus *Euphorbia*, are esteemed by Linnæus to have an involucre as well as a perianth; but we would rather use the term bractea for any external covering, or accompaniment, of a flower furnished with a real perianth.

When Linnæus and Magnol are said to have adopted a method of classing plants by the calyx, the former took into consideration, not only all his seven kinds of calyx, for that purpose, but also what he subsequently called corolla in grasses; and in his subdivisions is obliged to have recourse to the petals and stamens. Magnol takes a still wider and unauthorized range, though founded on the ideas of ancient authors. He terms the perianth the external calyx, the pericarp the inner. (See *PERICARP*.) He insists on the presence of a calyx in every case, applying that name to whatever *incloses* or *supports* the flower; so that it may mean the mere summit of a flower-stalk. The corolla is employed by this author, as well as by Linnæus, to form subdivisions of some of his principal classes.

PERIAPAT, in *Geography*, a town of Hindoostan; 27 miles N.E. of Coimbatore.

PERIAPATAM, a town of Hindoostan, in Mysore; taken in 1791 by the British army under general Abercromby; 24 miles S.W. of Seringapatam. N. lat. 12° 15'. E. long. 76° 31'.

PERIAPATTAM, a town of Hindoostan, in the Carnatic; 20 miles N.W. of Madras.

PERIAPTON, *περιπτον*, a kind of medicine, otherwise called *periamna*, or *amulet*; which, being tied about the neck, is supposed to prevent, or cure diseases.

PERIBOACA, in *Geography*, a river of Canada, which runs into the lake of St. John, N. lat. 48° 32'. W. long. 72° 20'.

PERIBOLE, in *Medicine*, a word used very frequently by Hippocrates, and in different places, in very different senses. Sometimes it signifies a translation of the humours from one part to another; sometimes only the dress or garments of a patient. In the first of these senses, the word is frequently used to express a translation of the morbid matter from the centre to the surface, in the termination of a disease, by the breaking out of pustules all over the body.

PERIBOLE, *περιβολη*, in *Rhetoric*, is used where many things are accumulated into one period; which might have been divided into several. We have an instance in Cicero's defence of Flaccus: "Quod si esset aliquando futurum, ut aliquis de L. Flacci pernicie cogitaret; nunquam tamen existimavi, judices, Decium Lælium, optimi viri filium, optimam ipsum spe præditum, summæ dignitatis, eam suscepturum accusa ionem, quæ sceleratorum potius civium odio, & furori, quam ipsius virtuti, atque institutæ adolescentiæ, conveniret."

Now this long period might very well have been divided into the three following: "1. Quod si esset aliquando futurum, ut aliquis de L. Flacci pernicie cogitaret; nunquam tamen existimavi, judices, Decium Lælium, eam suscepturum accusationem. 2. Est enim is optimi viri filius, optimam ipse spe præditus, summæ dignitatis. 3. Accusatio vero hæc sceleratorum potius odio et furori, quam ipsius virtuti

tuti atque institutæ adolescentiæ, conveniret." See PUNCTUATION.

PERICA, in *Geography*, three small islands in the bay of Panama, which give shelter to ships, out of the command of the town of Panama.

PERICALAMITES, in the *Materia Medica of the Ancients*, a name given by some to the *adarce*.

We find the word pericalamitis in a prescription recorded in Galen, and it has generally been understood to mean *Syrax*, that being called *calamita*: but the *adarce* is the thing signified by the name, which expresses its manner of formation, it being always found concreted about the stalks of reeds that grow on the edges of waters.

PERICARDIARY, an epithet given to worms generated in the pericardium, or capula of the heart.

M. Andry makes these one of the twelve kinds of worms engendered in the human body: they sometimes occasion convulsions, the paroxysms of which last but a little while, but return incessantly.

These worms are accompanied with a frightful paleness of the face, a low pulse, and violent pains of the stomach and breast.

They sometimes occasion a palpitation of the heart. M. Andry adds, that they have been known to occasion sudden death.

PERICARDITIS, in *Medicine*, signifies an inflammation of the *pericardium*, or membranous bag which surrounds the heart.

The symptoms which accompany an inflammation of the pericardium cannot be distinguished in practice from those which attend inflammation of the substance of the heart itself. In fact, the inflammations of both parts are often combined: for whenever the inflammation of the pericardium is violent, it extends to the muscular substance of the heart, to a considerable depth. The symptoms, which have been observed, are, the general affection of the system called fever; pain in the region of the heart, which is often, but not always, attended with palpitations, and with an irregular pulse, cough, difficulty of breathing, and sometimes syncope. But all these occur in inflammation of the heart. See CARDITIS.

PERICARDIUM, in *Anatomy*, (from *περι*, *about*, and *καρδια*, *the heart*;) the membrane surrounding the heart. See HEART.

PERICARP, PERICARPIUM, in *Botany*, from *περι*, *about*, and *καρπος*, *fruit*, (or more strictly, *seed*;) the seed-vessel. This is formed of the enlarged germen, and is extremely various in different plants. It is not necessarily always present, there being many tribes of plants in which the seeds are naked, and guarded only by the integuments of the flower. The latter in such cases not only enfold the seed, but in some instances so entirely assume the nature of a pericarp, as to become juicy and coloured; witness *Commelina Zannonia*, and the mulberry with its allies. Several genera of grasses are distinguished from others by the firm union of their hardened corolla to the seed, which takes place as the latter advances to maturity.

The use of the pericarp is to protect the seeds till ripe, and then, in some way or other, to promote their dispersion. It is curious to observe how admirably the very same part is contrived, to answer these opposite intentions. This is generally accomplished on hygrometrical principles. While moist or juicy, the valves remain closed; but in drying, they split or fly asunder; thus moreover, by an elastic action, assisting in the dispersion of their contents; and that in a dry state of the atmosphere, which is most favourable to the sowing of seeds in general. An exception to

this rule has been observed, in some annual species of *Mesembryanthemum*, natives of the sandy country of Africa, where the arid soil but rarely enjoys the benefit of rain. The capsules of these expand by means of wet alone, when the elastic valves, of each separate cell, project their seeds to a distance, to take advantage of a favourable moment for vegetation, that might not soon occur if they were sent abroad during the dry season.

Juicy pericarps commonly serve for the food of animals, more especially birds, in whose dung their seeds are deposited, at a distance from the spot where they grew, and in a condition peculiarly favourable for vegetation.

The different kinds of pericarp will be found under the different articles of CAPSULE, FOLLICLE, LEGUME, BACCA, DRUPA, POMUM, SILIQUA, STROBILUS. Hence genera, and occasionally even natural orders, derive some of their most important marks of distinction.

PERICARPIA, *περικαρπια*, compounded of *περι*, *about*, and *καρπος*, *the wrist*, a name sometimes given to medicines that are applied to the wrist: otherwise called *epi-carpia*.

PERICHÆTIUM, in *Botany*, from *περι*, *about*, and *χαίτη*, *a hair or bristle*, is a scaly sheath, peculiar to mosses, which owes its name to its situation around the base of their bristle-like fruit-stalk. It belongs also to the male, or barren, flowers of these plants, and indeed constitutes their calyx in both sexes. The *perichætium* consists of several imbricated leaves, differing, in a more or less striking manner, from the genuine foliage of the plant, either in structure, dimensions, or colour. In *Hypnum* it is of great consequence, constituting, by its presence, a part of the generic character, and assisting powerfully, by its diversities of shape, proportion, or structure, in the discrimination of species. Its duration is remarkable in some instances, even to the extent of three or four years, long after the seed and its pericarp have disappeared; of which we scarcely know an example among the generality of other plants. More frequently it is deciduous, after having accomplished its original purpose of protection to the tender organs which it encloses. See PERIGONIUM.

PERICHAREIA, a word used by the ancients to express a sudden surprise of joy, such as has been frequently known to occasion death.

PERICHONDRIUM, (from *περι* and *χονδρος*, *cartilage*;) the investing membrane of cartilages. See the article MEMBRANE, under the division *fibrous membranes*; and CARTILAGE.

PERICHORESIS. See CIRCUMINCESSION.

PERICHORUS, formed from *περι*, and *χωρα*, *country*, in *Antiquity*, a name given by the Greeks to their profane games and combats, *i. e.* to such as were not consecrated to any of the gods. See GAMES.

Perichorus, in the original, signifies *near*, or *neighbouring*; apparently because none of the people of the neighbourhood attended at these obscure exercises. The champions here did not fight in honour of any god, or hero, as in the others; but only for the prize-stake.

PERICHRISIS, a word used by the ancients for a liment principally of the oleaginous or spirituous kinds, and as thin and fluid as oil.

PERICLISIS, from *περι*, and *κλαω*, *to break*, in *Surgery*, a fracture attended with a considerable wound of the soft parts, and exposure of the bone.

PERICLES, in *Biography*, one of the most illustrious statesmen of ancient Greece, was a native of Athens, and son of Xantippus, a distinguished general, who gained

PERICLES.

the battle of Mycale against the Persians. He received the liberal education that was common among the Athenians of rank. One of his masters was Damon, who, under the pretext of teaching him music, in reality gave him lessons in politics. Another of his masters was the celebrated philosopher Anaxagoras, from whose instructions he gained an acquaintance with the phenomena of nature, that freed him from the effects of the superstitions of the times. Having an insatiable thirst for knowledge, he attended the lectures of Zeno of Elea, a philosopher and formidable disputant. By means of these, and other advantages which his situation in life gave him the command of, joined to excellent natural abilities and solidity of understanding, he acquired an elevation of sentiment, and strength of character, that enabled him long to maintain an almost uncontrolled authority over a people of all the most difficult to manage. The family connections of Pericles were with the aristocracy; but being sensible of the jealousy with which this party was viewed by the body of the people, in whom real power resided, and, moreover, finding the post of head of the nobility pre-occupied by Cimon, he at first held back from public affairs, and employed his talents in endeavouring to obtain the favour and suffrages of the democracy. The manners which he affected were opposite to those of Cimon: those of the latter were splendid and social; but Pericles avoided all entertainments and public amusements: he neither received nor paid any visits of ceremony, and was never seen abroad except in his way to the prytaneum and assembly, and maintained a constant gravity in his demeanour. Not being himself a member of the court of the areopagus, he endeavoured to lessen its authority. The species of eloquence which he adopted was of the lofty and dignified kind; and such were his powers, that he was said to thunder and lighten in his harangues. He was particularly careful to say nothing that might displease the people, and, probably through caution, left none of his orations in writing, though it was known that he wrote them all down before they were delivered. In early life, when the passions are more easily roused to action, he was celebrated for great patience in bearing any insults offered him, a quality which greatly favoured his rise. As an example of this power over his feelings, it is recorded, that having been treated with great outrage at a public assembly, by a simple citizen, who even followed him, at night, to his house, with the most abusive language, Pericles calmly ordered one of his servants to take a torch and light the man home.

When the popular party had procured the impeachment of Cimon, Pericles was appointed one of the conductors; he however acquitted himself with great moderation, and spoke of this great man with the respect due to his character and talents. The exile of his rival gave full scope to his ambitious pursuits. As Cimon had fed and clothed the people, for which he had received disgrace and banishment in return, Pericles, well knowing their passion for public diversions and shows, caused the poorer citizens to be supplied with money out of the treasury to enable them to obtain admission, and he likewise caused them to be paid for their attendance on the courts of judicature. In the war between the Athenians and Lacedæmonians, which broke out in the year B.C. 458, Pericles exposed himself to great danger at the battle of Tanagra, and afterwards unsuccessfully invaded the Peloponneseus, with a fleet and small body of troops. Finding the people desirous of the return of Cimon, he proposed a decree for that purpose; and it is said, through the medium of Elpinice, Cimon's sister, he made a private agreement with that general, that the latter should have the supreme command abroad, while he himself should direct the public affairs at

home. After the death of Cimon, Pericles may undoubtedly be regarded as the master of Athens. He contrived always to occupy the attention of the people, either in sending out new colonies or engaging in expeditions; and by public works, which he set on foot, he both flattered the vanity of the Athenians by the splendour of their city, and provided employment for a number of artists and mechanics of all descriptions. To supply the expences of these grand undertakings, he ventured upon a bold expedient, which was that of removing the public treasures of Greece from Delos to Athens, which violation of national faith he excused, by saying that the money having been raised for the purpose of defence against the barbarians, and the Athenians having by their sole efforts effectually answered this purpose, the allies had no longer any right to demand an account of its expenditure. His personal integrity with respect to pecuniary matters was above suspicion, of which a remarkable instance is recorded. While engaged in an expedition against Eubœa, the Lacedæmonians made an incursion into Attica. Pericles thought it most expedient to avert this storm by money, and accordingly, by means of a large bribe to the tutor of the king of Sparta, procured the return of their troops. When he came to make up his accounts, he charged a sum of ten talents, as "laid out in a fit manner upon a proper occasion;" and the Athenians passed the article without farther explanation. Pericles in his invasion of Eubœa, he made himself completely master of that important island in the year B.C. 447, and soon after concluded a truce of thirty years with the Lacedæmonians. Upon the occasion of a large present of corn to the Athenians by the king of Egypt, a law, which Pericles had procured to be passed, disfranchising all Athenians of half-blood, was enforced with such rigour, that 5000 persons, hitherto considered as freemen, were sold as slaves. This arbitrary act displays the great power of Pericles, but probably was not disagreeable to the majority of the citizens, whose consequence was increased by the diminution of the number. A war between the Athenians and Samians took place B.C. 440, which is said, in part, to have been produced by the influence of Aspasia and Pericles. It was on his return from the war that he pronounced the funeral oration which was ascribed to Aspasia, and which was so grateful to the Athenians, that the women crowded round him, and placed garlands on his head. After Thucydides had been sentenced to banishment, in the party contests of Athens, the authority of Pericles became still more overbearing, and at length excited the jealousy of the Athenians. Some of his friends were prosecuted: Anaxagoras, his revered preceptor, underwent a charge of irreligion. Aspasia was publicly accused both of impiety and of favouring the illicit amours of Pericles. He pleaded her cause in person, and procured her acquittal, and he prevented any personal attack upon Anaxagoras, by sending him out of Attica, himself accompanying him, as well to shew him a marked personal respect, as to save him from the rude attacks of the people. When the Spartans, taking part with the small states of Greece, sent their demands of reparation of injuries to Athens, denouncing war in case of refusal, Pericles, in a speech which is preserved by Thucydides, persuaded the Athenians to reject the conditions, and was thus the cause of the Peloponnesian war. His conduct was ascribed by some persons to the purpose of finding his countrymen so much employment, that they should not be able to attend to the accusations which his enemies were preparing against him; and a story to this effect is related by Plutarch, that young Alcibiades, seeing Pericles one day very thoughtful, and asking the reason, was told by him, that he was at a loss how to account for the public-money which had passed through

through his hands: then, said Alcibiades, "study to give no account at all."

When the war began B.C. 431, it was the advice of Pericles that the Athenians should neglect the defence of their estates in the country, and turn all their attention to fortifying the city, and equipping fleets. In pursuance of this policy, when he was appointed to the command, he suffered the superior army of the Spartans and their allies to advance without opposition, unmoved by the murmurs of the Athenians; but at the same time sent a powerful fleet to the coasts of Peloponnesus, and to Locris and Ægina, which more than retaliated the ravages committed in Attica. At the conclusion of the campaign, he exercised his powerful eloquence in a funeral oration for those who had fallen in the service of their country. In the next year began the memorable plague of Athens, and it required all the fortitude of Pericles to support his own spirits, and infuse courage into the hearts of his countrymen. From this time he underwent many mortifications, but his firmness did not on that account forsake him. At length, however, domestic calamity, united with public disaster, completely overwhelmed him. His eldest son Xantippus, who had lived on ill terms with his father, died of the plague, and the dreadful disease carried off the sister of Pericles, and almost all his relations and intimate friends. In short, Paralus, his only remaining son, by his first wife, also died; and at the funeral, as he was placing a wreath of flowers on the head of the corpse, he burst into tears, and withdrew in an agony of grief. The Athenians, to soothe him, repealed his own law for disfranchising children of the half-blood, and he enrolled as a freeman his son by Aspasia. But his end was now drawing near, and his faculties were well nigh impaired. He fell into a lingering illness, which enfeebled both his body and mind, still however the lamp was not entirely extinguished. Some vigour of intellect remained to the last; for when he lay near expiring, and his friends round his bed-side were enumerating the great actions of his life, he suddenly raised himself on his bed, and addressing them, said he wondered they should dwell upon circumstances in which fortune had the chief share, and which were common to him with many others, and forget that which was his peculiar glory, *viz.* "that no Athenian had ever put on mourning on his account." He died in the year B.C. 429. His character has been thus drawn: "though by no means a man of strict virtue, Pericles had many features of greatness. His philosophical education enlightened his mind, and raised him above the prejudices of the age. Of his happy application of this superiority the following instance is mentioned. As he was going on board his galley to take the command of the fleet, an eclipse of the sun took place, which terrified his pilot so as to render him incapable of his duty. Pericles, perceiving his embarrassment, pulled off his cloak, and wrapping it round the man's head, asked him if there were any thing ominous in being thus deprived of light? the man replied in the negative: then, said he, what difference can you make between this darkness and the other, except that which shades the sun is bigger than my cloak? The pilot felt the comparison, and was cured of his fear. The administration of Pericles is particularly memorable for the magnificent decorations it conferred on the city of Athens. Vast sums were undoubtedly lavished on those subjects, but they stamped that character of refined art upon Athens, which she retained after she had lost all her political distinction. Pericles was less excusable in fostering that high ambition and spirit of aggrandisement in his countrymen, which was the cause of their greatest disasters, and he too much favoured that corruption of manners of which he himself participated. Univer. Hist. Plutarch.

PERICLESE, in *Ecclesiastical Music*, a term in canto fermo. It implies the interposition of one or more notes in the intonation of certain chants, in order to arrive at the final close, and to inform the choir that they have to pursue and finish the rest. This, in secular music, would be called a cadence.

PERICLYMENUM, in *Botany*, *περικλυμένον*, an ancient name for some climbing shrub, has generally been applied to the common British Honeyfuckle (*see* LONICERA); or to other species of that genus.

PERICNEMIA, a word used by some medical writers for the parts about the calf of the leg.

PERICO, in *Geography*, a town of South America, in the province of Tucuman; 15 miles S. of St. Salvador de Jugue.

PERICONIA, in *Botany, a genus of *Fungi*, so named by Tode, from *περι*, *about*, and *κονις*, *powder*; because it is entirely surrounded, when ripe, with its own dusty seeds. Tode Fung. Mecklenb. v. 2. 2. Perf. Syn. 686.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.*

Ess. Ch. Stalk rigid, simple, terminating in a dry sari, naccous head.

The species are three. 1. *P. lichenoïdes*, Tode, t. 8. f. 61. This is found in summer on the stems of plants, and proceeds from a black crust-like base, so as very nearly to approach the nature of that genus of *Lichenes* called *Calicium*; 2. *P. byssoides*; and 3. *P. steemonitis*, both found likewise on the stems and branches of plants.

PERICRANIUM, from *περι* and *κρανιον*, *the skull*, in *Anatomy*, the periosteum of the skull.

PERIDIUM, in *Botany, a term introduced by Perfoon, for the round, membranous, dry case of the seeds, in some of his first section of *Fungi*, the *Angiocarpi*, which bear their seeds internally, and not throughout the surface of an expanded membrane called **HYMENIUM**; see that article.—The various kinds of Puff-ball, *Lycoperdon* and its allies, afford good examples of a *Peridium*.*

PERIDONIUS LAPIS, in *Natural History*, a name given by some of the writers of the middle ages to the *pyrites*, which they call also *pyrithe*.

PERIDOT, in *Mineralogy*. See **CHRYSOLITE**.

PERIDOT Granuliforme of Haüy. See **OLIVIN**.

PERIDROME, **PERIDROMUS**, in the *Ancient Architecture*, the space or an isle in a periptere, between the columns and the wall.

Salmassius observes, that the peridromes served for walks among the Greeks.

PERIDROMIDES, *Περιδρομίδης*, in *Antiquity*. See **XYSTI**.

PERIDROMOS, a word used by the old Greek writers to express the extreme edge of the hairs of the head, when hanging down in their natural form.

PERIEGETES, *Περιηγέτης*, a Greek term, signifying a person who leads or conducts another about a thing, to shew it him, &c.

It is applied in antiquity to geographers; especially to those who described the sea-coasts: thus Dionysius is styled *periegetes*, for publishing a geography in hexameter verses, which Eustathius has commented on, both in Greek.

The name *periegetes* was also given to those who conducted strangers about in cities, to shew them the antiquities, monuments, curiosities, &c. thereof. These were the same with what they now call the antiquaries in Italy.

PERIERS, **BONAVENTURE DES**, in *Biography*, a French writer, was born at Arnai-le-Duc, in Burgundy. In 1536 he became valet-de-chambre to Margaret of Valois, sister of Francis I. He published several translations and other pieces,

pieces, in verse and prose; but he is chiefly noted for his work, entitled "Cymbalum Mundi," written first in Latin, and translated by himself into French, under a fictitious name, first printed at Paris in 1537 by Morin, who was imprisoned on account of it. This work consists of four dialogues in the Lucianic style, ridiculing the follies and false opinions of mankind. It has been charged with gross impiety, upon the supposition, that under the appearance of laughing at the heathen theology, it meant to mask an attack upon Christian mysteries, and religion in general. It was censured by the theologians of Paris, and ever after passed as a prohibited, or at least a scandalous work, on which account it became very rare, and much sought after by the curious. It is said the author of it made an unhappy end, by falling on his sword in a fit of despair. Moreri.

PERIERS, in *Geography*, a town of France, in the department of the Channel, and chief place of a canton, in the district of Coutances; 8 miles N. of Coutances. The place contains 2557, and the canton 10,255 inhabitants, on a territory of 140 kilometres, in 16 communes.

PERIESTECOS, in *Medicine*, an epithet for diseases, signs, and symptoms, which are salutary, and prognosticate the future better health of the patient.

PERIGÆUM, PERIGEE, formed of *περι* and *γη*, earth, in *Astronomy*, that point of the sun's or moon's orbit, wherein they are at their least distance from the earth.

In which sense perigee lands opposed to apogee.

PERIGEE, in the *Ancient Astronomy*, denotes a point in a planet's orb, wherein the centre of its epicycle is at the least distance from the earth.

PERIGNAC, in *Geography*, a town of France, in the department of the Lower Charente; 10 miles S.E. of Saintes.

PERIGONIUM, in *Botany*, a more recent term than *Perichætium*, invented by Linnæus for the same part in Mosses, the scaly leaves investing the flowers. It is derived from *περι*, about, and *γεννη*, generation, and being common to the flowers of those plants in general, whether male or female, united or separated, the author judged it more proper than a word which literally applied only to the leaves that surround the fruit-stalk. (See *PERICHÆTIUM*.) There is however no end of thus changing terms, when once generally established; and the inconveniences of such a measure, greatly counterbalance any possible advantages. This improved denomination conveys no new idea, nor additional information, but rather less; for it is, in its meaning, ambiguous, as applicable to both *calyx* and *corolla*; whereas these plants possess a distinct and peculiar *corolla* in their *calyptra*, which is equally a *perigonium*, as encompassing the flower during impregnation, but not a *perichætium*, because it is removed upwards, as soon as the fruit-stalk, or *bristle*, is formed. *Perichætium* therefore, as an appropriate appellation for the calyx, and for the calyx only, is preferable, in our opinion, to *Perigonium*.

PERIGORD, in *Geography*, a country of France, so called before the revolution; now the department of the Dordogne.

PERIGRAPHE, a word usually understood to express a careless or inaccurate delineation of any thing: but in Vesalius it is used to express the white lines or impressions that appear in the musculus rectus of the abdomen.

PERIGUEUX, in *Geography*, a town of France, and principal place of a district, in the department of the Dordogne, and the capital of Perigord before the revolution; the see of a bishop, and residence of a governor. This place has some remains of antiquities, has an amphitheatre,

a temple of Venus, &c. It is famous for its partridge-pies, which are sent all over Europe. The town contains 5733, and the canton 11,676 inhabitants, on a territory of 140 kilometres, in 10 communes. N. lat. 45° 11'. E. long. 0° 47'.

PERIGYNOUS INSERTION, in *Botany*, from *περι*, about, and *γεννη*, a female, expresses the insertion of the stamens neither above nor below the germen, but into a surrounding part, whether calyx or corolla. Such is the character of the third, sixth, ninth, and fourteenth classes in Jussieu's system. In the first of these instances the author considers such insertion to be into the calyx; as he arbitrarily so denominates the covering of the flower, in all his monocotyledonous classes, whatever its appearance or structure may be, and whether it be single, as in most, or double, as in *Narcissus*, *Tulbaghia*, &c. In the 6th class he assumes a similar principle. In the 9th he considers the insertion to be sometimes into the calyx, sometimes into the corolla. In the 14th the stamens, as well as the polypetalous corolla, are inserted into the calyx.

Mr. Salisbury, in a paper published by the Linnæan Society, in the 8th volume of its Transactions, contends that there is no such thing in nature as an insertion of stamens into the calyx, but that where they proceed from any real integument of the flower, it must be a corolla. This appears to us well made out, with respect to the liliaceous plants. But the most valuable part of Mr. Salisbury's paper is a demonstration that Jussieu has, in various instances, mistaken the origin of the stamens, and that in such they are inserted into the receptacle, which he is pleased to name *torus*, and not into either calyx or corolla. This is the case with the *Atriplices*, *Junci*, and *Polygoni*; while in the *Bicornes*, the corolla, whether it bears the stamens or not, is itself inserted into the receptacle, not as Jussieu supposes, into the calyx, and therefore the plants of that order are neither mediately nor immediately perigynous.

The chief difficulty in the subject before us, and it is one of the most arduous in theoretical botany, respects Jussieu's 14th class. In the plants which compose this class, Mr. Salisbury considers every thing below the line where the stamens are inserted, whatever its appearance, texture, or substance may be, as either a germen, or a receptacle, alias *torus*. We should feel little difficulty in acceding to this decision as far as concerns *Pyrus*, *Mespilus*, *Rosa*, &c.; but it surely would be forcing analogy too far to name the lower part of the deciduous calyx of *Amygdalus* a receptacle, and the teeth only a calyx, though both together are forced off entire, by the swelling germen, nor is there any line of distinction between them. Neither among the *Onagra* of Jussieu, can we bring ourselves to distinguish between the teeth of the calyx, though deciduous, and its tube, in *Epilobium*, or *Fuchsia*. In *Ribes*, whose affinity to *Saxifraga*, so ingeniously pointed out by Mr. Salisbury, we cannot but admit, the whole calyx, bearing the faded petals and stamens, falls off entire. Who can distinguish its lower part from the upper, so as to term one a calyx the other a receptacle? Perhaps these are among the exceptions to which all systematic laws, as applied to nature, are always found liable. We do not point them out for the sake of invalidating an ingenious hypothesis, which we consider as throwing great light upon the subject, at least; but rather as matter of caution. The curious reader may find in the Transactions of the Linnæan Society, v. 10. p. 3—5, and on the subject of calyx and corolla, in *Introductio ad Botanicam*, more than we think it necessary to introduce here, on a matter chiefly hypothetical.

PERIHELIIUM, formed from *περι*, and *ηλιος*, sun, in *Astronomy*,

Astronomy, that point of the orbit of a planet, or comet, wherein it is at its least distance from the sun.

Perihelium stands opposed to aphelium. The ancient astronomers, instead of this term, used *perigæum*; because they placed the earth in the centre.

PERIJA, in *Geography*, a town of South America, in the government of Caraccas; 80 miles S.W. of Maracaybo.

PERILEUCOS, in the *Natural History of the Ancients*, a name given to an agate; but not of a distinct species, but only a particular appearance of the lead-coloured agate, more usually known among them by the name of *phassa-chates*.

PERILLA, in *Botany*, a name of whose meaning or derivation we find no account. Linn. Gen. App. 578. Schreb. 387. Willd. Sp. Pl. v. 3. 83. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. v. 3. 390. Juss. 113. Lamarek Dict. v. 5. 186. Illustr. t. 503.—Class and order, *Didynamia Gynnospermia*. Nat. Ord. *Verticillate*, Linn. *Labiata*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, erect, permanent, cloven half way down into five nearly equal segments, the uppermost very short. Cor. of one petal, irregular, four-cleft; the upper segment emarginate; the lateral ones spreading; the lower longer, obtuse. Stam. Filaments four, simple, distant, shorter than the corolla; anthers cloven. Pist. Germens superior, four; styles two, thread-shaped, joined together, the length of the filaments; stigmas simple. Peric. the unchanged calyx. Seeds four.

Ess. Ch. Upper segments of the calyx very short. Stamens separate. Styles two, joined together.

1. *P. oeymoides*. Balm-leaved Perilla. Linn. Syst. Veg. ed. 14. 533. Willd. n. 1. (*Melissa maxima*; Arduin. Spec. fasc. 2. 28. t. 13.)—Originally obtained by Arduino from India. It was introduced at Kew in 1770, by M. Richard, where it flowers in July and August.—Root annual, branched. Stem erect, herbaceous, three feet or more in height, quadrangular, furrowed, purple when old, rough with hairs. Branches opposite, crossing each other in pairs, short. Leaves opposite, stalked, ovate, rough, veined beneath, acute at each end. Bractæas lanceolate, erect, scarcely hairy. Flowers in spikes at the extremities of the stem and branches, all inclined one way, very hairy, of a white colour. Seeds ovate, rusty-coloured, reticulated.—The whole plant has a strong balsmy fragrance, and may be substituted for the balm of the shops.

PERIM, in *Geography*, a small island in the straits of Babel-Mandeb, about four miles from the coast of Africa, having a good port, but no fresh water. N. lat. $12^{\circ} 36'$. E. long. $43^{\circ} 50'$.

PERIMETER, formed from *περι*, and *μετρον*, *measure*, in *Geometry*, the ambit or extent that bounds a figure or body.

The perimeters of surfaces, or figures, are lines: those of bodies are surfaces.

In circular figures, &c. instead of perimeter, we say circumference or periphery.

PERINÆOCELE, from *perinæum*, and *κελη*, a rupture, in *Surgery*, a rupture, or hernia, in the perinæum.

PERINALDO, in *Geography*, a town of France, in the department of the Maritime Alps, and chief place of a canton, in the district of Monaco; 18 miles E.N.E. of Nice. The place contains 1283, and the canton 4858 inhabitants, on a territory of $57\frac{1}{2}$ kilometres, in 6 communes.

PERINDA, a town of Hindoostan, in Dowlatabad; 23 miles S.E. of Carmulla. N. lat. $18^{\circ} 33'$. E. long. $75^{\circ} 50'$.

VOL. XXVI.

PERINDARY, a town of Hindoostan, in Coimbetore; 5 miles S.W. of Errood.

PERINDE VALERE, in the *Canon Law*, a dispensation granted a clerk, who being legally incapable of a benefice, or other ecclesiastical function, is *de facto* admitted to it.

The perinde valere is a kind of writ, thus called from two words therein signifying the dispensation to be equivalent or tantamount to a legal capacity.

PERINENEUCOS, an epithet given to a peculiar sort of irregular pulse common in hectic patients, in which the artery beats more strongly in some parts than in others. See EPINENEUCOS.

PERINEUM, from *περινειον*, the penis, in *Anatomy*, that part of the body which extends from the organs of generation in either sex to the anus. The space in question is much longer in the male, than in the female; being about four or five inches in the former, one inch, or one and a half in the latter. A roughish line, called the raphe, runs along the middle of it. A few hairs are scattered over it. Some muscles are placed under the skin in this part, and are called muscles of the perineum; these are the transversus, and transversus alter perinei; see INTESTINE; erector penis, see GENERATION; and accelerator urine, see ACCELERATOR. There is also a small artery, called arteria perinei. (See ARTERY.) The perineum is more particularly described in the article GENERATION.

PERINGIANO, in *Geography*, a town of the island of Sardinia; 20 miles S. of Villa d'Iglesias.

PERINGOODY, a town of Hindoostan, in Marawar; 20 miles N.W. of Ramanadporum.

PERINGSKIOLD, JOHN, in *Biography*, a learned Swede, was born in Sudermania, in 1654. He became secretary of antiquities and counsellor to the king of Sweden, and professor at Upsal. He died in 1720. His works are "A History of the Kings of the North;" "History of the Kings of Norway," in two vols. fol.; "Historical and Chronological Tables from Adam to Jesus Christ."

PERINRAPAX, in *Geography*, one of the Laccadive islands, in the Indian sea. N. lat. $11^{\circ} 10'$. E. long. $71^{\circ} 18'$.

PERIOCHA, Περιοχη, an argument, indicating the sum of a discourse.

PERIOD, Περίοδος, in *Astronomy*, the time taken up by a star or planet in making a revolution; or the duration of its course, till it return to the same point of the heavens.

The sun's, or properly the earth's, period is three hundred and sixty-five days, five hours, forty-nine minutes. That of the moon is twenty-seven days, seven hours, forty-three minutes, &c. The periods of the comets are now many of them pretty well ascertained. See COMET.

There is a wonderful harmony between the distances of the planets from the sun, and their periods round him; the great law of which is, that the squares of the periodic times are ever proportional to the cubes of their mean distances from the sun.

For the several periods and mean distances of the several planets, see SOLAR SYSTEM, and each planet respectively.

PERIOD, in *Chronology*, denotes an epocha, or interval of time, by which the years are accounted; or a series of years, whereby, in different nations, and on different occasions, time is measured.

Such are the Calippic and Metonic periods, two different corrections of the Greek calendar; the Julian period, invented by Joseph Scaliger; the Victorian period, &c.

PERIOD, *Calippic*. See CALIPPIC PERIOD.

PERIOD, *Constantinopolitan*. See JULIAN PERIOD.

PERIOD, *Dionysian*. See VIKTORIAN PERIOD.

PERIOD, *Hipparchus's*, is a series of three hundred and four solar years, returning in a constant round, and restoring the new and full moons to the same day of the solar year; according to the sentiment of Hipparchus.

This period arises by multiplying the Calippic period by four. Hipparchus assumed the quantity of the solar year to be 365 days, 5 hours, 55' 12"; and hence concluded, that in one hundred and four years Calippus's period would err a whole day. He therefore multiplied the period by four, and from the product cast away an entire day. But even this does not restore the new and full moons to the same day throughout the whole period: but they are sometimes anticipated 1 day, 8 hours, 23' 29" 20". See **CALIPPIC Period**.

PERIOD, *Julian*, so called as being adapted to the Julian year, a series of seven thousand nine hundred and eighty Julian years; arising by the multiplication of the cycles of the moon, the sun, and indiction, *viz.* 28, 19, 15, into one another; commencing from the first day of January in the Julian year.

The Julian period is also produced by multiplying the Victorian period by fifteen. Since every year in the Julian period has its particular cycles of the moon, sun, and indiction; *e. gr.* only the first has the moon's cycle one, the sun's cycle one, and cycle of indiction one; all the years of this period are accurately distinguished from each other.

This period was invented by Scaliger, as a common receptacle of epochas, to facilitate the reduction of years of a given epocha to those of another epocha likewise given. It agrees with the Constantinopolitan epocha, or period, used by the Greeks, except in this, that the cycles of the sun, moon, and indiction, are reckoned differently; and in that the first year of the Constantinopolitan period differs from that of the Julian period.

To find the year answering to any given year of the Julian period, and *vice versa*, see **EPOCHAS**.

PERIOD, *Metonic*, or *Cycle*. See **CYCLE of the Moon**.

PERIOD, *Victorian*, an interval of five hundred and thirty-two Julian years; which elapsed, the new and full moons return on the same day of the Julian year, according to the sentiment of the inventor Victorinus, or Victorius, who lived in the time of pope Hillary.

Some ascribe this period to Dionysius Exiguus, and hence call it the Dionysian period: others call it the *great paschal cycle*, because it was invented for computing the time of Easter.

The Victorian period is produced by multiplying the lunar cycle nineteen, by the solar circle eighteen; the product of which is five hundred thirty-two. But neither does this restore the new and full moons to the same day throughout its whole duration, by 1 day, 16 hours, 58' 59" 40".

PERIOD, *Chaldaic*. See **SAROS**.

PERIOD, in *Grammar* and *Rhetoric*, denotes a little compass of discourse, containing a perfect sense; distinguished at the end by a point or full stop (.) ; and its members or divisions marked by commas, colons, &c.

De Colonia defines period, a short, but perfect sentence, consisting of certain parts or members, depending one on another, and connected together by some common vinculum.

The celebrated definition of Aristotle is, a period is a discourse which has a beginning, a middle, and an end, all visible at one view.

Rhetoricians consider period, which treats of the structure of sentences, as one of the four parts of composition.

The periods allowed in oratory are three: a period of two

members, called by the Greeks *dicolos*, and the Latins *bimembris*; a period of three members, *tricolos*, *trimembris*; and a period of four, *quadrimembris*, *tetracolos*.

A strict oratorical period does not allow of either more or fewer than these: it is possible indeed to introduce a period of one member, called by Aristotle *monocolos*, or simple period; but it will be reputed a flaw, and is a thing never practised by the masters.

The period may be likewise prolonged to five or six members; but then it changes its name, and, instead of period, commences what they call a *periodical discourse*.

A period of two members Cicero supplies us with: "Ergo & mihi mea pristinae vitae consuetudinem, C. Cæsar, interclusam aperuisti: & his omnibus ad bene de republica sperandum quasi signum aliquod sustulisti."

A period of three members the same Cicero gives us in the exordium of his Manilian oration: "Nam cum antea per ætatem hujus auctoritatem loci contingere non auderem; statueremque nihil huc nisi perfectum ingenio, elaboratum industria, afferri oportere; omne tempus amicorum temporibus transmittendum putavi."

A period of four members he gives us in that admirable description of punishment of parricides: "Ita vivunt, ut ducere animum de cælo non queant: ita moriuntur, ut eorum ossa terram non tangant: ita jactantur fluctibus, ut nunquam abluantur: ita postremo ejiciuntur, ut ne ad saxa quidem mortui conquelescant."

The laws and measures of periods are pretty strictly regarded by orators, at least they are so by the ancient ones: in ordinary discourse, and in the modern tongues, authors are much less severe. In oratory, the members of periods are to be equal, or nearly equal; that the pauses or rests of the voice at the close of each member may be nearly equal: but in writing not intended for rehearsal, this is disregarded.

Common discourse allows of periods both longer and shorter than oratory; which admits of none less than two members, nor greater than four. Short mutilated periods break the stream, and check the course of the sublime; and long ones embarrass and keep the mind too long in suspense; and even strain the voice, which is never to stop but at the ends of periods. Philareus, Hermogenes, Terence, &c. confine the just period, called by the Latins *ambitus* and *circuitus*, to four members; agreeably to the distich:

"Quatuor e membris plenum formare videbis
Rhetora circuitum, five ambitus ille vocetur."

Of which sentiment is Cicero, who in his Orator says, "Constat ille ambitus & plena comprehensio e quatuor fere partibus, quæ membra dicuntur, ut & aures impleat, & ne brevior sit quam satis sit neque longior." An instance of a periodical discourse the same author gives us in the opening of his oration for Archias the poet: "Si quid in me sit ingenii, judices, quod sentio quam sit exiguum; aut si qua exercitatio dicendi, in qua me non inficior mediocriter esse versatum; aut si hujuscæ rei ratio aliqua ab optimarum artium studis & disciplina profecta a qua ego confiteor nullum ætatis meæ tempus abhorruisse; earum rerum omnium vel in primis hæc A. Licinus fructum a me repetere prope suo jure debet."

In the formation of these periods, two things are chiefly to be regarded, their length and cadence. As the length ought to be suited to the breath of the speaker, the ancient rhetoricians scarcely admit of more than four colons. As to the cadence, what Cicero has observed is found true by experience, that the ears judge what is full, and what is deficient; and direct us to fill up our periods, that nothing be

wanting

wanting of what they expect. When the voice is raised at the beginning of a sentence, they are in suspense till it be finished; and are pleased with a full and just cadence, but are sensible of any defect, and are displeas'd with redundancy. Care must, therefore, be taken, that periods be neither deficient, and as it were maim'd, that is, that they do not drop before their time, and defraud the ears of what seem'd to be promis'd to them; nor, on the other hand, offend them by too long and immoderate excursions. This rise and cadence of the voice in pronunciation depend on the nature and situation of the members. In a period of two members, the turn of the voice begins with the latter member. If a sentence consists of three members, the inflexion is best made at the end of the second member. But a period of four members is reckon'd the most complete and perfect, where the inflexion begins at the middle, that is, with the third member. An equality of the members should likewise be attend'd to in the composition of a period, the better to adjust their rise and cadence. And for this reason in sentences of three members, where the cadence begins with the third; or in those of four members, where it begins at the fourth, it promotes the harmony to make the last member the longest. Ward's Or. vol. i. lect. 22. See SENTENCE.

Periods are said to be either *rotundi*, round, or *quadrati*, square, according to their different economy and cadences.

PERIOD, *Square*, is that consisting of three or four equal members, formally distinguished from each other: as that of Cicero on the punishment of parricides.

PERIOD, *Round*, is that whose members or parts are so connect'd, and fitted into each other, as that the junctures or commissures are scarcely seen; but the whole slides equally round, without any notable stops or inequalities. Such are the *dicolos* and *tricolos* of Cicero above mention'd.

PERIOD is also used for the character (.) with which the periods of discourse are terminated and express'd; this is popularly call'd a *full stop*, or *point*. See PUNCTUATION.

Father Buffier observes two difficulties in the use of the period, or point; *i. e.* in distinguishing it from the colon, or double point; and in determining justly the end of a period, or perfect sentence.

It is observ'd, that the supernumerary numbers of a period, separat'd from the rest by colons and semicolons, usually commence with a conjunction. Yet it is certain these same conjunctions sometimes rather begin new periods, than supernumerary members of old ones. It is the sense of things, and the author's own discretion, that must make the proper distinction which of the two in effect it is. No rules will here be of any service, unless this be admitted as one, that when what follows the conjunction is of as much extent as what precedes it, it is usually a new period: otherwise not.

The second difficulty arises hence, that the sense appears perfect in several short detached phrases, wherein it does not seem there should be periods: a thing frequent in free discourse; as, *We are all in suspense: make your proposals immediately: you will be to blame for detaining us longer.* Where it is evident, that simple phrases have perfect senses like periods, and ought to be marked accordingly; but that the shortness of the discourse making them easily comprehended, the pointing is neglected.

PERIOD, *Semi*. See SEMI-Period.

PERIOD, in *Numbers*, is a distinction made by a point or comma, after every sixth place, or figure: and is used in numeration, for the reader distinguishing and naming the several figures or places, which see under NUMERATION.

PERIOD, in *Medicine*, signifies both the paroxysm and the

interval of those diseases, which occur and cease, and again return and go through a similar course, at regular periods of time. See INTERMITTENT.

PERIOD of the *Blood*, *periodus sanguinis*, the circle of the blood, or the tour it makes round the body, for the support of life. See CIRCULATION.

PERIOD of *Perfection*, in *Greek Music*. With respect to the period of greatest perfection in the music of Greece, it is a subject which seems to merit some discussion. Plato, Aristotle, Aristoxenus, and Plutarch, were for ever complaining of the corruption and degeneracy of music. The pious Plato, indeed, regard'd it as fit only for the gods, and their celebration in religious ceremonies, or as a vehicle for religious and moral lectures in the education of youth; and with a methodical spirit censur'd all such as was used in theatres, social festivity, or domestic amusement; but modern divines might, with equal propriety, declaim against the profane use of bread as an aliment, because it is administered in the most solemn rite of our religion. A line should certainly be drawn between the music of the church and of the theatre; but totally to silence all musical sound, except upon solemn occasions, seems to border upon downright fanaticism.

With respect to perfection and depravity, there is nothing so common among musical disputants, as for the favourers of one sect to call that *degeneracy*, which those of another call *refinement*. But Plato seems to have been always too fond of ideal excellence in every thing, to be satisfied with any other.

PERIODEUTA, Περαιοδευτής, a church officer among the Greeks, established by the council of Laodicea, in towns, &c. where there were no bishops.

The *periodeutæ* were a kind of rural deans; so called according to Zonaras, because always on the road, going from one quarter to another, to keep the people in their duty.

Hence Gregory of Thessalonica calls them *ambulantes*, *walkers*. Balsamon calls them *exarchæ*; by which name they are known among the Greeks at this day.

PERIODIC, PERIODICAL, something that terminates and comprehends a period.

PERIODIC, in *Grammar*, is applied to a style, or discourse, that has numbers, or which consists of just and artful periods.

PERIODICAL DISEASES are such as occur, in regular paroxysms, at certain intervals of time. In this sense they are nearly the same as intermittents. See INTERMITTENT.

PERIODICAL *Month*. See MONTH.

PERIODICAL *Winds*. See WINDS.

PERICEI, Περικαιοί, formed from περι, *about*, and οικησ, *I inhabit*, in *Geography*, such inhabitants of the globe as have the same latitudes, but opposite longitudes; or live under the same parallel, and the same meridian, but in different semicircles of that meridian, or opposite points of the parallel.

These have the same common seasons throughout the year, and the same phenomena of the heavenly bodies; but their hours, or times of the day, are opposite to each other. When, *v. gr.* with the one it is mid-day, with the other it is midnight.

PERIOPHTHALMIUM, compounded of περι, *about*, and οφθαλμος, *eye*, in *Natural History*, a thin skin, which birds can draw over their eyes to defend them, without shutting their eye-lids; otherwise call'd the nictitating membrane.

PERJOREE, in *Geography*, a town of Bengal; 10 miles W. of Curruckdeagh.

PERIOSTEUM, from περι, and οστέον, *a bone*, in *Anatomy*, the membrane which covers the bones. See **MEMBRANE**.

The periostrum is liable to inflammation from a variety of causes, and particularly the venereal disease and the scurvy: this generally terminates in an abscess or gangrene: if not speedily removed, the bones will be injured. The cure is, in general, the same as in other inflammations; but the particular intention will be to carry the peccant matter outwards by fomentations and incisions. Cases of this kind generally terminate in amputation.

PERIPATETIC PHILOSOPHY, the system of philosophy taught and established by Aristotle, and maintained by his followers, the Peripatetics.

A specimen of the Peripatetic philosophy, see under **ARISTOTELIAN**.

PERIPATETICS, Περηπατητικοί, a sect of philosophers, the followers of Aristotle, or the maintainers of the Peripatetic philosophy: called also Aristotelians.

Cicero tells us, that Plato left two excellent disciples, Xenocrates and Aristotle, who founded two sects, which only differed in name; the former taking the appellation of Academics, who were those that continued to hold their conferences in the academy, as Plato had done before: the others, who followed Aristotle, were called Peripatetics; from περιπατεῖν, *I walk*; because they disputed walking in the Lyceum; which was a grove in the suburbs of Athens, which had previously been used for military exercises. See **LYCEUM**.

Ammonius derives the name Peripatetic from Plato himself, who only taught walking; and adds, that the disciples of Aristotle, and those of Xenocrates, were equally called Peripatetics; the one Peripatetics of the Academy, the other Peripatetics of the Lyceum; but that, at length, the former quitted the title Peripatetic, for that of Academic, on occasion of the place where they assembled; and the latter retained simply that of Peripatetic.

The greatest and best part of Aristotle's philosophy, (for an account of which, see the biographical article of **ARISTOTLE**;) he borrowed from his master Plato: Serranus affirms confidently, and says he is able to demonstrate it, that there is nothing exquisite in any part of Aristotle's philosophy, dialectics, ethics, politics, physics, or metaphysics, but is found in Plato. And of this opinion are many of the ancient authors, Clemens Alexandrinus, &c.

Gale endeavours to shew, that Aristotle borrowed a good deal of his philosophy, both physical, about the first matter, and metaphysical, about the first being, his affections, truth, unity, goodness, &c. from the sacred books; and adds, from Clearchus, one of his (Aristotle's) scholars, that he made use of a certain Jew, who assisted him therein.

Aristotle, when he withdrew to Chalcis (see his article), was succeeded in the school of the Lyceum by one of his favourite pupils, Theophrastus, whom he appointed to this office in the 2d year of the 114th olympiad, B.C. 323. (See **THEOPHRASTUS**.) Under his conduct the Peripatetic school maintained such high reputation that he had about 2000 scholars. Theophrastus was succeeded by Strato of Lampascus (see **STRATO**), who undertook the charge of it in the 3d year of the 123d olympiad, B.C. 286. After his death this school was continued, in succession, by Lycon of Troas, who enjoyed the friendship of Attalus and Eumenes, and filled the chair till the 138th olympiad; by Aristotle of the island of Cos, whom Cicero characterizes as more distinguished for the elegance of his language than the depth of his philosophy; by Critolaus, a Lydian, who, with Carneades and Diogenes, was deputed by the Athenians on an

embassy to Rome, and who is said to have held the doctrine of the eternity of the world; and by Diodorus, with whom the uninterrupted succession of the Peripatetic school terminated. Of this school *Demetrius Phalereus* was an illustrious ornament, see his article. The Peripatetic philosophy found its way into Rome, in the time of Sylla, with the writings of Aristotle and Theophrastus. However, the obscurity of Aristotle's writings greatly obstructed the progress of this philosophy; and Cicero, who seems to have had some respect for the Peripatetic philosophy, acknowledges that it was understood by very few even of the philosophers themselves. Under the Cæsars, it regained its ancient credit; and from the time of Andronicus, the preceptor of Plutarch, who, with Tyrannio, brought it to Rome, to that of Ammonius, that is, till the time of Nero, the peripatetic doctrines were taught with great purity in its schools. But after Ammonius it began to experience the influence of that spirit of confusion, which prevailed among the Eclectic philosophers; and the plan of Antiochus, who had formerly attempted a coalition between Aristotle, Plato, and Zeno, was revived. From this time the Peripatetic sect was divided into two branches; the one consisting of such as attempted to combine the doctrines of other schools with those of Aristotle; the other, including those who wished to follow more closely the steps of the Stagyræite.

Julius Cæsar and Augustus patronized the Peripatetic philosophy; the former in the person of Sosigenes, the latter in that of Nicolaus. Under the tyrannical reigns of Tiberius, Caligula, and Claudius, it experienced worse fortune; many excellent men of this sect, as well as others, being either banished from Rome, or obliged, through fear of persecution, to remain silent. In the reign of Nero, the philosophers of this sect, as well as others, enjoyed the temporary protection of the imperial court; but after a period of five years, they shared the fate of the professors of magical arts, or, as they were then called, mathematicians, and were again banished the city. During the first century of the Roman empire, we find few celebrated names among the Peripatetic philosophers. The principal are Sosigenes, Boethius, Nicolaus, and Ægeus. About this time Ammonius, the preceptor of Plutarch, attempted to extend the authority of Aristotle beyond the limits of his own sect, by blending the Platonic and Stoic doctrine with the Peripatetic. After his death many Platonists studied the writings of Aristotle, and commented upon them; and thus prepared the way for the formation of the Eclectic sect under Ammonius Saccas, who flourished about a century later than Ammonius the Peripatetic. (See **AMMONIUS** and **ECLECTICS**.) After this time we meet with several genuine followers of Aristotle, of whom the most celebrated was Alexander Aphrodisæus. (See his article.) Among the Eclectic commentators upon Aristotle, we may reckon, besides Porphyry, Jamblichus, Plutarchus, Nestorius, &c., Darippus, Themistius, Olympiodorus, and Simplicius. From this concise detail, we may learn, that under several of the Cæsars, the philosophers of this school shared, with their brethren, the common discouragements and infelicities of oppression. The concise and logical method of philosophizing, which prevailed in this school, could obtain few admirers at a period remarkable for a loose and florid kind of eloquence. Besides, the doctrine, which the Peripatetics of this period had received from their master, suffered much adulteration from the unwearied endeavours of the Alexandrian philosophers to establish an Eclectic system. Many bold, but injudicious grammarians and critics, attempted to supply chasms, and to clear up absurdities, in the writings of Aristotle, from their own ingenious conjectures, which they presumed to incorporate with

PERIPATETICS.

the author's text. Even Alexander Aphrodisæus, who professed to restore the genuine Aristotelian system, not confining himself to the doctrine of his master, contributed towards its adulteration. But nothing proved so injurious to the Peripatetic philosophy, as the rage for commenting upon the works of Aristotle, which prevailed among his followers. Notes, paraphrases, arguments, summaries, and dissertations, piled up, century after century, under the general name of commentaries upon Aristotle, created, as might be expected, endless disputes concerning the meaning of his writings; and it may perhaps be asserted with truth, that their genuine sense, after all the pains which have been taken to explore it, yet remains, in many particulars, undiscovered.

Some knowledge of the Aristotelian system was introduced among the Jews by Aristobolus, an Alexandrian Jew, who lived in the reign of Ptolemy Philometer, and was an admirer of the Greek philosophy. In order to facilitate the study of Aristotle among the Jews, his writings were, in a subsequent period, translated from the Arabic into the Hebrew tongue; and towards the close of the 13th century, the name of Aristotle was so highly respected among the Jews, that they not only called him the prince of philosophers, but maintained that his philosophy was the perfection of human science, and could only be excelled by the doctrine of divine revelation; and in order to screen themselves from censure for submitting to receive wisdom from a heathen philosopher, they pretended that Aristotle was himself a profelyte to Judaism, and was indebted to Solomon for a great part of his philosophy.

The commencement of the Aristotelian philosophy among the Arabians may be referred to the time of Al-Mamon, who, among other writings in various languages, caused the works of Galen and of Aristotle to be translated into Arabic. After his death, which happened in the year 833, philosophy continued its progress among the Saracens, to which the eminent schools that were founded in different parts of the empire in no small degree contributed. (See SARACENS.) In order to accommodate the established system, which was guarded by the sanction of penal laws, to their philosophical ideas, they blended the abstract speculations of the schools with the gross and vulgar conceptions of the Koran. They made use of the subtleties of the Aristotelian philosophy in the defective and corrupt state in which it had come into their hands, to assist them in improving upon the literal meaning of their sacred books, and thus gave a new, and for the most part a metaphysical, turn to the religion and law of Mahomet. This, it is said, by one of their own writers, was the origin of their religious sects. Many of the Arabian philosophers, among whom we may reckon Jacobus-Al-Kendi of Bassora, Al-Farabi, or Abu Nair, a native of Balch Farab, who flourished in the 10th century, Al-Rasi, called also Abubeker and Al-Mansor, a native of Rai, in Persia, Avicenna, Avenpace, a Spanish Saracen, who flourished about the middle of the 12th century, Avenzoar of Seville, Thophail of the same city, and Averroes, acquired celebrity by their commentaries upon Aristotle, and other philosophical works. In every branch of science, in which Aristotle led the way, the Arabian philosophers followed him as an infallible guide; inasmuch that their tenets, as far as they are distinct from the peculiar dogmas of the Koran, are, without variation, those of the Peripatetic school.

In the earlier ages of Christianity, the Platonic philosophy was more generally preferred to the Peripatetic: the Christian fathers pointed the severest censures against the Peripatetic and Epicurean sects. The doctrines of the Peripatetics concerning divine providence, and the eternity

of the world, chiefly excited their aversion against this sect; and besides this, they were much displeased with Aristotle, for having furnished heretics and infidels with the weapons of sophistry. Nevertheless this did not prevent the doctrine of Aristotle from forcing its way into the Christian church. Towards the close of the fifth century, it rose into considerable credit: the Platonics, interpreting, in their schools, some of the writings of Aristotle, particularly his dialectics, and recommending them to young persons. This seems to have been the first step to that universal dominion, which Aristotle afterwards obtained in the republic of letters; which was also very much promoted by the controversies which Origen had occasioned: he was zealously attached to the Platonic system: and, therefore, after his condemnation, many, to avoid the imputation of his errors, and to prevent their being counted among the number of his followers, openly adopted the philosophy of Aristotle. Nor was any philosophy so proper for furnishing those weapons of subtle distinctions and captious sophisms, which were used in the Nestorian, Arian, and Eutychian controversies. About the close of the sixth century, the Aristotelian philosophy, as well as science in general, was almost universally decried; and it was chiefly owing to Boethius, who had explained and recommended it, and who united the Platonic with the Aristotelian doctrine, that it obtained a higher degree of credit among the Latins than it had hitherto enjoyed. Towards the end of the seventh century, the Greeks, abandoning Plato to the monks, gave themselves up entirely to the direction of Aristotle, and in the succeeding century, the Peripatetic philosophy was taught every where in their public schools, and propagated in all places with considerable success. John Damascenus, who flourished at the beginning of the eighth century, very much contributed to its credit and influence, by composing a concise, plain, and comprehensive view of the doctrines of the Stagirite, for the instruction of the more ignorant, and in a manner adapted to common capacities. Under the patronage of Photius, and the protection of Barda, the study of philosophy, having for some time declined, revived again about the end of the ninth century. About the year 1050, a revolution in philosophy commenced in France; when several eminent logicians, who followed Aristotle as their guide, took nevertheless the liberty of illustrating and modelling anew his philosophy, and extending it far beyond its ancient limits. In the twelfth century, three methods of teaching philosophy were practised by different doctors; the first was the ancient and plain method, which confined its researches to the philosophical notions of Porphyry, and the dialectic system, commonly attributed to St. Augustine, and in which were laid down this general rule, that philosophical inquiries were to be limited to a small number of subjects, lest, by their becoming too extensive, religion might suffer by a profane mixture of human subtilty with its divine wisdom. The second method was called the Aristotelian, because it consisted in explications of the works of that philosopher, several of whose books, being translated into Latin, were almost every where in the hands of the learned. The third was termed the free method, employed by such as were bold enough to search after truth, in the manner the most adapted to render their inquiries successful, without rejecting the success of Aristotle and Plato.

About this time, dialectic philosophy was supposed to be the key of theology, without which it would be impossible to unlock the mysteries of sacred wisdom. On account of this supposed alliance between logic and theology, the former was made the principal object of study in all the schools, and those who excelled in the dialectic art were regarded with

PERIPATETICS.

with the highest admiration, and attended by crowds of pupils. The Aristotelian philosophy had now for several centuries been studied by the Saracens, and was at this time taught in their schools in Spain. These schools were visited by many of the western Christians, who learned Arabic, that they might be able to read translations of Aristotle, and other philosophical writers, and who afterwards translated many Arabic books into the European tongues. Another cause which served to establish a general taste for the Peripatetic philosophy, and particularly for the Aristotelian logic was, that about this period many Greek copies of the writings of Aristotle were brought from Constantinople into the west. Before this time, though they had been read in the original by a few monks, more learned than the rest, most persons had been contented with the translations of Victorinus and Boethius. But, at the beginning of the 12th century, the original writings of Aristotle were studied in Paris; whence they were introduced among the Germans, by Otho of Freisingen, in the time of Abelard. The guardians of the church were alarmed by the inundation of new opinions, which this fondness for logical disputations introduced; and after having sentenced the works of two Parisian teachers of theology to be publicly burned, a general prohibition of the use of the physical and metaphysical writings of Aristotle in the schools, was issued first by the synod of Paris, and afterwards, under pope Innocent III., by the council of Lateran. The evil that had caused the alarm was not suppressed; but the fondness for the subtleties of Aristotelian logic and metaphysics became so general, that the orthodox clergy complained, that scholars spent their whole time in disputation. It was at length found necessary, under certain restrictions, to favour the study of Aristotle. Accordingly his dialectics, physics, and metaphysics, were by express statute received into the university of Paris. It was ordered, however, in 1231, by a bull of pope Gregory IX., that only such books of Aristotle should be used in the schools, as had been examined and purged from errors. In several other countries, the Aristotelian philosophy was received with less opposition. In England, the writings of the Stagirite were read with great avidity; and in Germany and Italy the study of Aristotle was very much encouraged. The name of Aristotle, from the end of the twelfth century, obtained universal dominion; and so far were his writings, after this time, from falling under the censure of councils and popes, that the philosophy of Aristotle, and that of the Saracens, became the main pillars of ecclesiastical hierarchy. In the year 1452, Charles VII. ordered the works of Aristotle to be read and publicly explained in the university of Paris. Thus the union between the Peripatetic philosophy and the Christian religion was confirmed, and Aristotle became not only the interpreter, but even the judge of St. Paul. At the commencement of the reformation, Luther, who was early initiated in the Peripatetic philosophy, rejected both this and the scholastic, as not only irreconcilable with the Christian system, but the cause of endless controversies in the Christian church. In various parts of his writings he expresses great contempt for Aristotle and his followers. Melancthon so far espoused the doctrine of Aristotle, as to attempt the revival of the pure Peripatetic philosophy in the schools. Although at the beginning of the 16th century, the scholastic philosophy began to fall into general contempt, Aristotle still retained, in a great degree, his authority. This event was owing to many concurring circumstances. The partizans of the Platonic system, who, under the patronage of the Medicean family, had long maintained their ground against the Aristotelians, lost their influence as that of their patrons de-

clined; and the advocates of the Peripatetic philosophy proportionally increased, and, after a violent conflict, obtained a victory. This victory was facilitated and completed by those enquirers extending beyond the region of metaphysics and theology, into the subjects of natural history and philosophy, which were now prosecuted. Among the followers of the church of Rome, the Peripatetic philosophy continued to be zealously maintained, on account of the assistance which its dialectics afforded them in the defence of the established system; and because many of the doctrines of this system coincided with those of the school of Aristotle. The deference which had been long paid to the decisions of Aristotle, induced the first restorers of learning to direct their principal attention to his writings: accordingly the number of critics and common tutors became very considerable. The first persons of this description employed themselves in verbal, rather than philosophical criticism, and in correcting the text of their author. But commentators of a different class were chiefly employed, from Pomponatius to the middle of the seventeenth century, in ascertaining and restoring the true Aristotelian philosophy. It would be an endless task to enumerate all the learned men, who, in the fifteenth and sixteenth centuries, attached themselves to the Aristotelian system. Among the Roman Catholics we may mention Nicholas Leonicus Thomæus, a Venetian, born in 1457, who seems to have been one of the first that attempted to restore the genuine Aristotelian philosophy; Pomponatius of Mantua, born in 1462, who taught the doctrines of Aristotle and Averroës in the schools of Padua and Bologna, and who had many followers of great celebrity; such were Simon Porta, a Neapolitan, Julius Cæsar Scaliger, a celebrated philologist, and Lazarus Bonamicus, who rivalled Erasmus in elegant Latinity:—Majeragius of Milan:—Sepulveda of Cordova:—Peter Victor of Florence:—Zubaralla of Padua:—Strozza of Florence:—Cæsalpinus, an Italian:—and Cæsar Cremoninus of Modena. Among the Protestants, especially in Germany, we find in their public schools many learned men, who were followers of Aristotle. At the commencement of the reformation, indeed, both the *scholastic* philosophy, (which see,) and the dogmas of Aristotle, were rejected with great indignation, particularly, as we have already observed, by Martin Luther. But afterwards, when men of the soundest judgment and best erudition, perceived the value of philosophy as a guard against fanaticism, much labour was devoted to the promotion of learning, and to the encouragement of a love of science. The first place in this class of reformers is unquestionably due to Philip Melancthon (see his article.) At Leipzig, Simon Simon of Lucca was distinguished; in the academy at Tubingen flourished Jacobus Schegkuis, and in that of Altdorf, Philip Scherbius, whose contemporary, of the same school, was Nicholas Taurullus. To these we may add Ernestus Soverus, a native of Nuremberg, and Hermannus Conringius, one of the most illustrious ornaments of the Germanic schools, (see his article); and also Christianus Drierus, a native of Stettin in Pomerania, Melchior Zeidler of the same place, and Jacobus Thomafius of Leipzig, chiefly memorable as the preceptor of the illustrious Leibnitz.

The general prepossession in favour of the Aristotelian system, which from a variety of causes, some of which have been enumerated, prevailed for several centuries after the revival of letters, was attended with much inconvenience and mischief. Opinions were imbibed from the Peripatetic philosophy, wholly inconsistent with the principles of true religion; such as, for example, that God, the first mover, wholly intent upon the contemplation of his own intellect, disregards

disregards the affairs of the world; that the Intelligence, which presides over the lower sphere, is the universal soul of the world, of which all men partake; and consequently, that the soul of man has no distinct existence, and will no longer subsist as such, than whilst the body continues to live. In consequence of these and similar tenets infidelity prevailed; and the minds of the multitude, both ecclesiastics and laity, were deeply tinctured with Atheism; and this fatal relaxation of principle produced an uncommon depravity of manners. In order to restrain this evil, the fathers of the Lateran council issued a bull in 1510, against the Aristotelian corruptions; but the Peripatetics ridiculed this idle fulmination. The Stoicite having, for many centuries, possessed authority in the schools little inferior to that of Jesus Christ in the church, and his dogmas being intimately interwoven with those of religion, it was thought exceedingly hazardous to whisper any thing to the discredit of his philosophy. This reverence for Aristotle was supported, in Popish universities, by statutes which required the professors to promise upon oath, that in their public lectures on philosophy they would follow no other guide. Among Protestants, the errors and corruption of the Peripatetic philosophy met with opposition; but it was attended with little success. Several eminent men ventured to inveigh against Aristotle himself, as the author of many pernicious errors. But, still, his system, for the most part, retained its authority, and even those who forsook this master, thought it necessary to make choice of some other ancient guide; so that, after all, the question was, what Aristotle, Plato, or Pythagoras had taught rather than what was truth.

The Peripatetic system, after having prevailed with very great and very extensive dominion for many centuries, began rapidly to decline towards the close of the seventeenth century, when the disciples of Ramus attacked it on the one hand, and it had still more formidable adversaries to encounter in Des Cartes, Gassendi, and Newton. Brucker's Hist. of Philos. by Enfield. Mosheim's Eccl. Hist. See ARISTOTLE.

PERIPEŒIA, Περὶπέσια, in the *Drama*, that part of a tragedy in which the action is turned, the plot unravelled, and the whole concludes.

The word is formed from the Greek Περὶπέσια, something falling into a different state; formed of Περὶ, *about*, and Πέσσω, *cado*, *I fall*.

The peripetia is properly the change of condition, whether happy or unhappy, which the principal person or persons undergo; arising from some discovery, or incident, which gives a new turn to the action.

The peripetia, therefore, concludes with the catastrophe, or unravelling; unless we make the peripetia to depend on the catastrophe, &c. as an effect on its cause.

The peripetia is sometimes induced by remembrance, or discovery; as in the *Œdipus*, where the messenger sent from Corinth to invite *Œdipus* to the crown, informs him, that Polybus and Merope were not his father and mother; which begins a discovery, that Laius, whom he had killed, and Jocasta, whom he had then to wife, were his father and mother, and throws him into the deepest distress. This instance Aristotle calls a *double peripetia*.

The qualities of the peripetia are, that it be probable and necessary; in order to which it must be the natural result, at least the effect, of the foregoing action, or of the subject itself; and must not start out from any foreign, or collateral cause.

Sometimes the peripetia is occasioned without any discovery; as in the *Antigone* of Sophocles, where the change

in Creon's fortune is produced by the effect of his own obstinacy; and sometimes by a mere change of the will, which, though the least artful, yet, Mr. Dryden observes, may be so managed, as to become exceedingly beautiful.

These two cases Aristotle calls *simple peripetias*; in these the change only consists in a passage out of trouble and action into tranquillity and rest. See FABLE ACTION, &c.

PERIPHALLIA, Περὶφάλλια, in *Antiquity*, the same with *phallogia*. See PHALLAGOGIA and DIONYSIA.

PERIPHERES, a term in the *Ancient Greek Music*, which signifies a series of notes ascending, or descending, and which in a manner return upon themselves. The *peripher* was formed upon the *Anacamplos* and the *Eutibia*.

PERIPHERY, formed from Περὶφραζω, *I surround*, or Περὶ, *about*, and Φέρω, *I bear*, or *carry*, in *Geometry*, the circumference or bounding-line of a circle, ellipsis, parabola, or other regular curvilinear figure.

The periphery of every circle is supposed to be divided into three hundred and sixty degrees; which are again subdivided, each into sixty minutes, the minutes into seconds, &c.

The division of degrees, therefore, are fractions, whose denominators proceed in a sexagecuple ratio; as, the minute $\frac{1}{60}$, second $\frac{1}{3600}$, third $\frac{1}{21600}$. See SEXAGESIMAL.

But these denominators being troublesome, in their stead are used the indices of their logarithms; hence the degree, being the integer, or unit, is marked by $^{\circ}$, the minute by $'$, second by $''$, &c. See CIRCLE, and CIRCUMFERENCE.

PERIPHERY. *Angle at the*. See ANGLE.

PERIPHRAŒSIS, Περὶφρασις, *circumlocution*, formed of Περὶ, *about*, and Φραζω, *I speak*, in *Rhetoric*, a circuit, or tour of words, much affected by orators, to avoid common and trite manners of expression.

The periphrasis is of good use on many occasions: and we are frequently forced to have recourse to it, to make things be conceived which are not proper to name.

It is often a piece of politeness to suppress the names, and only intimate, or design them. These turns of expression are also particularly serviceable in oratory; for, the sublime admitting of no direct citations, there must be a compass taken to insinuate the authors whose authority is borrowed. A periphrasis, by turning round a proper name to make it understood, amplifies and raises the discourse; but care must be taken it be not too much swelled, nor extended *mal à propos*; in which case it becomes flat and languid. See CIRCUMLOCUTION.

PERIPHYMOSIS. See PARAPHIMOSIS.

PERIPLOCA, in *Botany*, an old name, adopted by Tournefort and Linnæus, derived from Περὶ, *about*, and Πλοκω, *a binding*, or *twining*. It alludes to the long trailing stems and branches, which twine about each other to a great extent. Linn. Gen. 119. Schreb. 166. Willd. Sp. Pl. v. 1. 1248. Mart. Mill. Dict. v. 3. Sm. Prodr. Fl. Græc. Sibth. v. 1. 165. Brown Tr. et Vern. Soc. v. 1. 57. Ait. Hort. Kew. v. 2. 74. Juss. 146. Tourn. t. 22. Lamarck Illustr. t. 177. Jacq. Misc. v. 1. t. 1. f. 2. Class and order, *Pentandria Digynia*. Nat. Ord. *Contortæ*, Linn. *Apocineæ*, Juss. *Asclepiadeæ*, Br. wn.

Gen. Ch. *Cal.* Perianth inferior, minute, in five ovate permanent segments. *Cor.* of one petal, wheel shaped, in five deep, oblong-linear, abrupt, convex, oblique, widely spreading segments, having five awned scales alternate with them. *Stam.* Filaments five, distinct, oblong, flattened, bearded at the summit; anthers of two remote cells, each cell cohering with that of the neighbouring anther; masses of pollen granulated, solitary, in four parts, applied to the stigma,

stigma. *Pist.* Germens two, ovate, approximated; styles combined above; stigma capitate, scarcely pointed, dilated, and notched at the top. *Peric.* Follicles two, cylindrical, widely spreading, smooth. *Seeds* numerous, imbricated, crowned with hair. *Receptacle* longitudinal, thread-shaped.

Ess. Ch. Corolla wheel-shaped, with five awned scales at its sinuses. Filaments distinct. Anthers coherent, bearded above. Masses of pollen five, granular. Stigma nearly pointless. Follicles cylindrical, widely spreading, smooth. Seeds crowned with hair.

Obs. From this genus are now separated, by Mr. Brown, *P. Secamone* of Linnæus, and *emetica* of Willdenow; both referred to his genus SECAMONE, hereafter to be described: as are *P. esculenta* of Linnæus, see OXYSTELMA; *P. indica*, see HEMIDESMUS; *P. capsularis* of Forster, see PARSONSIA; and *P. sylvestris* of Willdenow, see GYMNEMA. *P. tunicata* of the last-mentioned author appears to be likewise rejected by Mr. Brown; but we neither know the plant, nor where he has placed it. The Linnæan *P. africana* is made by him a *Cynanchum*. The following species only therefore remain.

1. *P. græca*. Common Periploca. Linn. Sp. Pl. 309. Sm. Fl. Græc. Sibth. t. 249, unpubl. Schmidt Arb. v. 1. t. 46. (*P. foliis oblongis*; Hort. Angl. t. 15. Duham. Arb. v. 2. 104. t. 21. *P. repens angustifolia*; Ger. Em. 902.)—Corolla hairy on the upper side. Leaves ovate, acute.—Native of hedges and thickets in the Levant. Dr. Sibthorp gathered it on mount Athos and near Prusa. Gerarde had the plant in his garden, and it has ever since been cultivated in England, as a hardy climber, flowering plentifully in July and August, and distinguished by the absurd name of Virginian silk. Lord Bute sent a description of this *Periploca*, as a new genus, without any idea of its being a described plant, to Peter Collinson, which the latter forwarded to Linnæus. The stem twines round every thing in its way to the extent of several yards, and is much branched, round, and smooth. Leaves opposite, on short stalks, ovate, sharp-pointed, entire, smooth and shining, very beautiful, two or three inches long, deciduous; the lowermost on each branch short, rounded and obtuse. Flowers corymbose, at the ends of short lateral branches, inodorous, singularly elegant though not ostentations, brown, with a velvet softness, each an inch in diameter. They convey an idea of some brown kinds of Auricula.

2. *P. levigata*. Smooth-flowered Periploca. Ait. Hort. Kew. ed. 1. v. 1. 301. Willd. n. 3. (*P. puniceifolia*; Cavan. Ic. v. 3. 9. t. 217.)—Corolla smooth. Leaves obovate.—Native of the Canary islands, whence it was sent by Mr. Masson to Kew in 1779, and where according to Cavanilles it is called *Granadillo*. The stem is stouter and more upright than in the former. Leaves smaller, mostly obovate. Flowers yellowish-green, equally terminal, but smaller and smooth. We find their segments frequently emarginate, though sometimes entire, agreeing in those respects with the following.

3. *P. angustifolia*. Narrow-leaved Periploca. Labillard. Syr. fasc. 2. 13. t. 7. Willd. n. 4.—Corolla smooth. Leaves lanceolate, obtuse.—Gathered by M. Labillardiere, from whom we have a specimen, near Laodicea ad mare, and in the island of Lampedusa. It is also found in Barbary. The stem seems still more upright and straight than in the last, and the leaves are more lanceolate, but their flowers exactly agree, notwithstanding a supposed difference in the apex of each segment, pointed out by Willdenow. This is very probably a variety of the *levigata*.

Mr. Brown mentions a fourth species, brought by Dr.

Afelius from Sierra Leone, which we have not seen, and of which no character or description is given.

PERIPLUCA, in *Gardening*, comprises plants of the woody climbing kind, of which the species cultivated are the common Virginian silk or periploca (*P. græca*); the green periploca (*P. secamone*); the Indian periploca (*P. indica*); and the African periploca (*P. africana*).

The first is sometimes called *climbing dog's-bane*.

The second species has a twining, shrubby, even stem: the leaves are opposite, petioled, even, underneath paler, veined transversely: the panicles axillary, alternate, dichotomous, shorter than the leaves: the flowers are small. It differs obviously from the first sort in its small copious flowers. It is said to be a native of Egypt; but its place of growth is uncertain; flowering in July.

The third has many slender stalks, which twine about each other, and by a shrub, or other support, will rise near three feet high, putting out several small side-branches; these are hairy, as are also the leaves; which are about three quarters of an inch long, and half an inch broad, standing by pairs upon very short footstalks; the flowers come out in small bunches from the side of the stalks; are small, of a dull purple colour, and have a sweet scent. It flowers in the summer, but does not produce seeds in this climate. It is a native of the Cape.

In the third sort there is a variety with smooth leaves and stalks, which comes from the Cape.

Method of Culture.—These plants may be easily increased by layers made from the young wood in the early spring or summer season. When they are fully rooted, they may be taken off, and planted out, the first or hardy kind, either where they are to remain, or in the nursery, to be afterwards removed; and the two last, or tender sorts, into pots, to be protected during the winter. The first sort likewise often succeeds by cuttings, and also the two last by the use of the hot-bed.

But they may all be increased also, by sowing the seeds procured from abroad in pots of light earth, plunging them in the hot-bed.

They should all be placed near support, to prevent their trailing upon the ground and fastening about other plants.

Where the two last sorts are kept constantly plunged in the tan-bed of the stove, they thrive and flower much better than in any other situation, but they should not be kept too warm in winter, and in the summer they should have a large share of free air admitted to them; for when they are kept too close their leaves will be covered with insects, and the plants become sickly in a short time.

The first sorts only require a little protection in the winter. They all afford variety among potted plants in general.

PERIPLUS, Περπλῦς, a voyage, or navigation, round a certain sea, or sea-coast.

Arrian has described all the coasts of the Black sea, after having inspected them in quality of general of the emperor Adrian; to whom he dedicates the description, under the title "Periplus of the Euxine sea."

The "Periplus Hannonis" is one of the most curious fragments transmitted to us by antiquity, and it is the only authentic monument of the Carthaginian skill in naval affairs. But some doubts have been entertained concerning its antiquity. (See AFRICA.) The periplus of the Erythrean sea was published by Dr. Vincent. See also AFRICA.

PERIPLYSIS, a name given by some authors to a diarrhœa, in which the stools are extremely thin and watery, and very frequent, and large in quantity.

PERIPNEUMONY.

PERIPNEUMONY, in *Medicine*, from *περι*, and *πνευμων*, *the lungs*, is an inflammation of the lungs and their investing membrane.

The peripneumony (*peripneumonia*) has been commonly distinguished by medical writers from the pleurisy (*pleuritis*); the former appellation being applied exclusively to inflammation seated in the substance of the lungs themselves; and the latter to inflammation affecting the *pleura*, or investing membrane of the lungs, as well as its duplicate, which lines the interior surface of the cavity of the chest. This distinction, however, is of little moment; for, as Dr. Cullen observes, "neither do our diagnostics serve to ascertain exactly the seat of the disease, nor does the difference in the seat of the disease exhibit any considerable variation in the state of the symptoms, nor lead to any difference in the method of cure." We shall, therefore, treat of pulmonary inflammation as one disease, in the symptoms of which there may be some shades of difference in different cases, but to which it is scarcely necessary to appropriate different names.

Few diseases are so distinctly characterised by their symptoms as simple inflammation of the organs of respiration. However various its seat, or its degree of violence, it is accompanied by these four symptoms; namely, *fever*, *difficult breathing*, *cough*, and *pain* in some part of the *thorax*. These symptoms may be variously modified, in different instances; but they are all invariably present, where the lungs or their investing membrane are affected with inflammation.

The disease almost always begins with a cold stage, that is, with more or less chilliness and shivering, and this is speedily followed by increased heat, frequency of pulse, depression of strength, and other symptoms of what is called *fever*. Sometimes, however, the increase of the fever is very gradual, and the symptoms at first moderate, and the peculiar pectoral symptoms do not immediately appear; but frequently these symptoms accompany the fever from the beginning. For the most part the pulse is frequent, full, strong, hard, and quick; but, in a few instances, especially in the advanced state of the disease, it is weak and soft, and at the same time irregular.

The *difficulty of breathing* is always present, and the oppression is greatest in the act of inspiration; both because the air-cells of the lungs, being compressed by the turgidity of the blood-vessels, do not easily admit of a full dilatation, and because the dilatation and distention of the inflamed membranes aggravate the pain attending the disease. The difficulty of breathing is somewhat varied by the posture of the patient: it is generally greater when he lies upon the side affected; but sometimes the contrary happens; and often he cannot lie easy upon either side, and can breathe only with ease, when lying on his back: and sometimes the oppression becomes so great, that he cannot breathe easily, except when in somewhat of an erect posture. This *orthopnea*, as it is technically called, implies a dangerous degree of violence, although to a careless observer, the circumstance of the patient sitting up (when, in fact, he is unable to lie down) might lead to an inference, that the disease was moderate. The greater facility of respiration in the erect posture, under such circumstances, is the result of the more easy descent of the diaphragm, when the abdominal viscera no longer press it upwards, and the consequent more free dilatation of the lungs.

A *cough* is also an invariable attendant on peripneumony; but, in different cases, it varies much in its violence and urgency, and in the pain which it occasions. It is sometimes dry, that is, without any expectoration, especially

in the beginning of the disease; but it soon becomes moist, from the great effusion from the turgid vessels, and more commonly it is moist even from the first. The matter expectorated is various both in consistence and colour, and frequently it is streaked with blood; sometimes, indeed, blood is brought up in considerable quantity, yet without the injurious consequences attending an ordinary hæmoptysis.

The *pain* accompanying this disease, is, in different cases, felt in different parts of the thorax, but most frequently in one side. It has been said to affect the right side more frequently than the left; but this is by no means certain. Sometimes it is felt as if it were under the sternum, or breast bone; sometimes in the back between the shoulders; and sometimes darting from the one to the other. When the pain is in the sides, its seat is very various; but the part of all others most frequently affected, is about the sixth or seventh rib, near the middle of its length, or a little more forward; in which situation it is often severe and pungent; while, in others, it is often more dull and obtuse, with a sense of weight rather than of actual pain. In general it continues fixed in one place; but sometimes it shoots from the side to the shoulder-blade, on one hand, or to the sternum and clavicle on the other.

This varying state of the symptoms has been assumed as the foundation of the different appellations given to pneumonic inflammation, and especially the different degree of acuteness or obtuseness of the pain, of hardness or softness in the pulse, and of the oppression of respiration. An *acute* pain or stitch, fixed in one point of the side, and remarkably increased by the act of inspiration, and still more by that of coughing, together with a *hard* pulse, and a *dry* cough, at first, is considered as characterising an inflammation seated in the *pleura*, surrounding the lungs, or lining the ribs; and therefore constituting the *pleurisy*: while on the other hand, an *obtuse* and *deep-seated* pain in the breast, not remarkably increased by respiration, which is constantly oppressed, and often requires an erect posture, together with a pulse often *soft*, and frequently with a tumid and livid countenance, is deemed indicative of inflammation in the substance of the lungs, and therefore called more specifically, *peripneumony*. But although an attention to these different forms of the disease is necessary, as they afford important indications in respect to the prognosis, yet there is little foundation for referring the disease to a different seat in these cases. It seems probable, as Dr. Cullen justly suggests, that every acute inflammation begins in membranous parts; and in every dissection of persons dead of peripneumony and pleurisy, both the surrounding membrane and the substance of the lungs appear to have been affected with the inflammation. In short, wherever the disease begins, it appears to be communicated speedily to the other parts of the organ.

Some writers have given a particular appellation (*parapneumonitis*) to an inflammation of the pleura, covering the upper surface of the diaphragm, and have supposed it to be attended with peculiar symptoms of delirium, risus sardonicus, and other convulsive motions: but it is certain, that an inflammation of that portion of the pleura, and affecting also even the muscular substance of the diaphragm, has often taken place without any of these symptoms: nor have any dissections, or authentic records of dissections, afforded any support to the opinion, that an inflammation of the pleura, covering the diaphragm, is attended with delirium, more commonly than other pneumonic inflammation. See PARAPNEUMONITIS.

The causes of peripneumony are very well known. Persons

PERIPNEUMONY.

of a considerable vigour of constitution are most liable to be attacked with it: whence, although it may affect any age and either sex, it seldom occurs before the age of puberty, and most commonly in the middle age of life, from thirty-five to fifty-five, more frequently in men than in women, and seldom in those who are sedentary, or delicate from any other cause. Previous diseases of the lungs, such as asthma, or the pressure of a deformed chest, and particularly the previous occurrence of peripneumony itself, occasion a predisposition to this inflammation.

Among the occasional causes, *cold* is certainly the most common, especially sudden and great vicissitudes; whence peripneumony is most frequently seen in the winter and spring, and in cold climates. Like all the other organs of the body, the lungs are liable to be inflamed by violence, or by whatever obstructs, strains, or otherwise injures their structure: whence blows on the chest, falls, &c. sometimes produce peripneumony; great exertions of the voice or breath, such as loud and long-continued speaking, singing, or playing upon wind-instruments, or even violent exercise, occasionally excite the disease; excessive intemperance was also remarked by Hippocrates as one of the causes of pneumonic, as of other inflammations. Sometimes peripneumony occurs as a symptom of other inflammatory fevers, especially of the measles and small-pox; and in many cases, it originates from common catarrh, by an extension of the inflammation from the mucous membrane of the bronchiæ to the substance of the lungs. Sometimes again it originates from *metastasis*, as it is called, of gout, rheumatism, erysipelas, &c.; or at least, it comes on suddenly at the time when the external symptoms of these diseases disappear. Cold, under certain conditions of the atmosphere, has occasionally given rise to the disease, in great numbers of people at the same time, so as to produce a sort of epidemic peripneumony, and even to excite a suspicion of its depending upon contagion.

Inflammation of the lungs may terminate either in health, in death, or in some other disease. It terminates in health, by what is called the *resolution* of the inflammation. This process, however, seldom takes place without being attended by some evident evacuation. In some rare instances, a spontaneous hæmorrhagy from the nose, occurring early in the disease, has put a period to its course; or a copious diarrhœa has had the same effect: but these are not to be looked for. The evacuation most frequently occurring, and apparently the most effectual in promoting resolution, is an expectoration of a thick white or yellowish matter, often a little streaked with blood, and which is brought up copiously, and without violent coughing. If the violence of the inflammation is not subdued, it goes on to a fatal termination, or to end in some other state of disease. One termination, by which it ends fatally, is peculiar to inflammation in this organ; namely, an effusion or extravasation of blood and coagulable lymph into the interstitial substance of the lungs, which, by compressing at once both the air-cells and the blood-vessels, interrupt both the breathing and the circulation, and produce a fatal suffocation. The most common termination of pneumonic inflammation, when it is fatal in the early part of its course, seems, however, to be in an effusion of the coagulable lymph only into the cellular substance of the lungs, producing a similar compression. In other cases, the functions of breathing are interrupted by a profuse effusion of viscid mucus into the air-cells and bronchial passages, by which the access of air is prevented.

Where peripneumony goes through its course, it is apt to terminate in other diseases, especially in suppuration and abscesses. This of itself becomes a formidable malady, and, unless the constitution of the patient be vigorous, and the

abscess opens into the branches of the trachea by a small aperture, is often fatal. These abscesses, when they take place in the substance of the lungs, are called *vomica*: they sometimes consist of small cavities containing pus; and at other times the cavities are very large, so that the greater part of the substance of the lungs has been destroyed. Where they open into the cavity of the chest, emptying their contents there, the disease called *empyema* is produced. Sometimes, however, *empyema* is formed by an inflamed state of the pleura, exterior to the lungs. In either case, the pus may be accumulated in the whole cavity of the chest, or it may be confined to a part of it by adhesions taking place between the lungs and the pleura, which inveils the ribs: but when pus is evacuated into the cavity of the chest, by the bursting of an abscess in the lungs, it is almost always confined within certain limits by adhesions. See Baillie, *Morbid Anatomy*, p. 53.

These adhesions of the lungs to the ribs, or, more properly speaking, of the *pleura* investing the lungs to the same membrane lining the chest, are among the common consequences of pneumonic inflammation. Sometimes they extend over the greater part of the chest, and, tying the lungs closely to its *parietes*, produce a permanent difficulty of breathing, with a cough. Sometimes, however, they are only partial, and loosely tied, so as not to impede the free motion of the lungs. Where the adhesions are considerable, and the inflammation has been severe, another formidable disease occasionally ensues, namely, dropsy of the chest, from the effusion of a large quantity of serum from the inflamed surface into the cavity of the former.

It may be mentioned as a singular circumstance, however, that anatomists seldom examine a body after death, in which some degree of adhesion between the lungs and the ribs is not found. "There would often seem to be slight degrees of inflammation in the pleura," says the able morbid anatomist above quoted, "where the symptoms above stated have not existed at all, or have been so obscurely marked as to be altogether overlooked. In examining the chest of adults after death, it rarely happens that adhesions are not discovered in some part of it, uniting the surface of the lungs to the pleura, which lines the parietes of the chest. The marked symptoms of pleurisy, however, are by no means so frequent. It seems, therefore, probable, that slight inflammations may attack the pleura; sufficient, however, to throw out coagulable lymph, which is afterwards changed into adhesions, and yet persons shall not be sensible of any disease in the chest." *Morbid Anat.* p. 58.

A termination of peripneumony in gangrene is mentioned by authors, but we have never seen or read of any well authenticated instance of such a termination.

The accuracy of *prognosis*, in the early stages of peripneumony, is of considerable importance; since, if the opportunity of employing active remedies be passed by, it is not easy to retrieve the injury. The danger of the disease in the early stage is chiefly to be estimated by the degree of difficulty in the respiration. When the patient can lie on one side only; when he can lie on neither side, but upon his back only; and still more, when he cannot breathe with tolerable ease, except the trunk of his body be erect, the progressive impediment to the breathing will be obvious. And if, even in the erect posture, the breathing is extremely difficult; if there is also a turgescence, and flushing, or purplish hue of the face, together with partial sweats about the head and neck, and an irregular pulse; the danger of the disease is extremely great. It will be yet more alarming, if any degree of delirium or confusion of thought occur, or if the patient speaks merely of general indisposition, without referring

PERIPNEUMONY.

referring his sufferings to any particular organ. Under such circumstances, even where there is little apprehension on the part of the patient, and when his strength is not materially sunk, death often speedily ensues.

The violence of the fever may always be considered as an indication of a violent disease, as well as an acute pain, very much interrupting inspiration; but these are not more indicative of danger, than an obtuse pain, a weak oppressed pulse, and very difficult respiration. When the pains, which at first had affected one side only, have afterwards spread into the other; or when, leaving the side first affected, they entirely pass into the other; these are always marks of an increasing, and therefore of a dangerous disease. As the inflammation is seldom resolved without some expectoration, so a continued dry cough is always an unfavourable symptom: but a sudden cessation of the expectoration, after it had already commenced, is indicative of still more danger; as it implies either a great diminution of the patient's strength, or a renewed augmentation of the inflammation. A copious yellowish expectoration, tinged with blood, is therefore to be deemed favourable.

When peripneumony terminates fatally, this event most commonly happens within the first week, some time between the third and seventh days from the attack. Nevertheless, it is not unusual for the disease to undergo a remission within the same period, which may prove fallacious, and the violence of the disorder may be renewed with greater danger than before. Hence it occasionally happens, that the disease terminates in death in the second, third, or even fourth week, after several remissions and aggravations; a circumstance which should teach us, that we should not measure the activity of our remedies according to the period of the disease, but according to the actual condition of the symptoms.

When, however, a peripneumony has continued steadily for many days, with its symptoms neither very violent nor very slight, and without any marked remissions, *suppuration* is certainly to be apprehended. This, however, is not to be determined by the number of days; for instances of resolution have occurred as late as the tenth day, and even at a much later period, where great remissions have occurred. But if, during a steady continuance of the symptoms for ten or twelve days, no signs of a resolution have appeared; and if the difficulty of breathing have increased, while the pain and other symptoms have somewhat abated; and, at the same time, the expectoration, which had begun, have again ceased, suppuration must be confidently expected. When suppuration is actually begun, the patient is affected with frequent rigors or shiverings, and with a sense of cold felt in different parts of the body; the pulse also becomes less frequent and softer, but sometimes fuller than before, and occasionally quicker; and the patient can now lie more easily upon the affected side than upon the other. As the suppuration proceeds, there is a considerable remission of the pain, which had before subsisted, while at the same time the cough, and more especially the difficulty of breathing, continue, and are rather augmented. The frequency of the pulse is now rather increased, and the feverish state suffers considerable exacerbations every evening, and by degrees a *hectic* in all its circumstances is formed. When the abscess is fully established, there is sometimes a very evident enlargement of the side where the matter is accumulated. If it assume the form of *empyema*, the abscess must ultimately break and discharge its contents, either into the cavity of the chest, forming the disease just named, or into the branches of the trachea (windpipe). In the former case, it may be sometimes dis-

charged either by a natural ulceration of the intercostal parts, or by a surgical operation. (See *EMPHYEMA*.) In the latter, and more common termination, the patient may be suffocated by the sudden bursting of the contained pus into all the bronchial passages; or a copious purulent spitting may ensue, by which the abscess may be more gradually and safely emptied. Nevertheless, this mode of termination is pregnant with danger: for, although in a few individuals, of robust habit, this course of purulent expectoration, and the hectic that accompanies it, will be sustained until the abscess heals; yet, in the majority of cases, all the symptoms of true pulmonary consumption ensue, and the patient dies, worn out with the perpetual irritation and discharge.

Of the Cure of Peripneumony.—The extreme importance of the lungs in the living body, as the seat of a function the most necessary to life, and the obvious danger, just described, of allowing inflammation to proceed to suppuration, even after the more early fatality of this disease has been avoided, equally prove the necessity of an early and vigorous employment of remedies, when the symptoms of peripneumony or pleurisy occur.

The remedy chiefly to be depended upon is *blood-letting*, freely and early employed. The quantity of blood drawn must of course be regulated by the violence of the disease, and the vigour of the patient's constitution, and ought generally to be as large as this last circumstance will allow. The remission of the pain and the relief of the respiration, during the flowing of the blood, may limit the quantity to be then drawn; but if these symptoms of relief do not appear, the bleeding should be continued until some degree of sickness and faintness, the signs of approaching syncope, come on. This direction is as old as the writings of Hippocrates. It will often happen, that one bleeding, however copious, will not prove a cure of the disease: for although the pain and difficulty of breathing may be much relieved by the first bleeding, these symptoms very frequently recur after a short interval, and often with as much violence as before. In the event of such recurrence, the bleeding must be repeated, even in the course of the same day, and perhaps to the same quantity as before. Sometimes the second bleeding may be larger than the first. There are persons who are constitutionally liable to faint even upon a small bleeding; and, in such persons, this may prevent the drawing of so much blood at first, as a pneumonic inflammation may require; but as the same persons are frequently found to bear subsequent bleedings better than the first, these may be carried to the extent which the symptoms of the disease seem to demand. For it is according to the state of the symptoms, that the bleedings must be determined to be repeated; and they will be more effectual, when employed in the course of the first three days, than afterwards; but they are not to be omitted although four or five days may have elapsed, before the physician is called in; nay, if there be a recurrence of the urgent symptoms, as described above, the bleeding should be repeated at any period of the disease, especially within the first fortnight, and even afterwards, if a tendency to suppuration be not evident, or if, after an apparent solution, the disease shall have again returned.

There is in peripneumony, as in some other acute inflammations, a state of pulse occasionally recurring, which, to an inexperienced practitioner, appears to contra-indicate the use of the lancet: it is soft, and small, or what has been called an oppressed pulse; but it rises, and becomes fuller and larger after blood-letting. Under such circumstances, the propriety of the blood-letting is to be determined, by

PERIPNEUMONY.

the urgency of the other symptoms, especially of the difficulty of breathing. In a similar manner, a pulse that is irregular, and beats with considerable intermissions, in peripneumony, will become regular after the relief of blood-letting; and such a state of pulse, therefore, when the pneumonic symptoms are urgent, is not to be considered as contra-indicating, but as more strongly demanding, the use of the lancet.

With respect to the *quantity of blood* which ought, or which with safety may be taken away, no general rules can be delivered; as it must be different according to the state of the disease and the constitution of the patient. In an adult male of tolerable strength, a pound of blood, avoirdupois, is a full bleeding: any quantity above twenty ounces is a large, and any quantity below twelve, a small bleeding. Sydenham was of opinion, that the average quantity of blood necessary to be drawn for the cure of pleurisy, was forty ounces: but this must differ widely in different cases. If the bleeding be performed on the first or second day, perhaps a single bleeding of fourteen or sixteen ounces may be sufficient to effect a cure; but if it be delayed, several repetitions of the operation may be necessary, and a strong man will bear the loss of even four or five pounds, in the course of two or three days.

When a large quantity of blood has been taken from the arm, and then, from the state of the patient, the safety of a repetition of that evacuation is doubtful, some blood may be still taken locally, by means of *leeches*, or *cupping*. From the slowness of the operation of leeches, the cupping is commonly to be preferred. This *local blood-letting* will be particularly proper, when the continuance or recurrence of pain, rather than the difficulty of breathing, becomes the urgent symptom; and then the cupping and scarifying should be performed as near to the seat of the pain as possible.

Fomentations and poultices to the part pained have been recommended, and may be useful; but the application of them is often inconvenient, and certainly much less beneficial than that of *blisters*. Very early in the disease, a *blister* should be applied as near to the pained part as possible. But, as when the irritation of a blister is present, in the height of the inflammation, it seems to render bleeding less effectual, so its application should be delayed till blood-letting shall have been employed. If the disease be moderate, the blister may be applied immediately after the first bleeding; but if the disease be violent, and it is presumed that a second bleeding may be necessary soon after the first, it will then be proper to delay the blister till after the second bleeding, when it may be supposed that any further bleeding may be postponed, till the irritation arising from the blister shall have ceased. It may be frequently necessary in this disease to repeat the blistering: and, in that case, the plasters should always be applied somewhere on the thorax; for, when applied to more distant parts, they have little effect. Experience has proved, that keeping blistered parts open, or making what is called a perpetual blister, has much less effect than the repeated counter-irritation of a fresh blister.

Blisters are always safe; they do not weaken the patient; neither do they tend to interrupt the expectoration. Expectoration does sometimes take place early in the disease: but, at that period, if the symptoms continue urgent, the solution of the disease cannot be trusted to the expectoration; neither has the bleeding been found then to diminish it; on the contrary, it is often observed to promote it. It is only in the more advanced stages of the disease, when

the patient has been already much debilitated by large evacuations, and by the continuance of the disorder, that bleeding seems to stop expectoration; but under such circumstances, the bleeding is on every account improper.

While these evacuations are resorted to, it must be obviously necessary to adopt most rigorously what has been called the *antiphlogistic regimen*; to exclude every thing stimulating, both in quantity and quality, from the food and drink; to supply the patient with light diluent and acidulate fluids; to keep him entirely at rest, and to interdict him from unnecessary talking; and particularly to prevent the irritation which might arise from any increase of heat. For this purpose, it will be proper to keep the patient out of bed, while he can bear it easily; and, when he cannot, to cover him very lightly while he lies in bed: the temperature of his chamber should be kept uniformly cool.

Some practitioners, apparently upon theoretical grounds, have objected to the use of *purgatives*, upon the supposition that the evacuation which they occasion may tend to suppress the expectoration: but in the vigour of the patient and of the disease, such an apprehension is absolutely groundless. On the contrary, the free evacuation of the bowels, by cooling purgatives, conduces, like the blood-letting, to diminish the local and general inflammatory action. In the turgid and loaded state of the lungs, the straining of vomiting is likely to be productive of mischief, and can answer no useful purpose; the practice of exhibiting *emetics*, even in nauseating doses, is therefore to be deprecated, and is exploded by all judicious practitioners.

As the occurrence of a free expectoration is generally a favourable symptom, and often appears to put a termination to the disease, so various *expectorant* medicines, and other means of promoting this excretion, have been proposed. But none of these appear to be possessed of any efficacy; and some of them, being acrid stimulant substances, cannot be administered with safety. It is more than questionable, indeed, whether there is any substance in nature, which possesses a direct expectorant power. (See EXPECTORANT.) The gums, such as ammoniacum, myrrh, &c. usually employed, are too heating to be given in an inflammatory affection; and squills, &c. though less stimulant, have no power, perhaps, independent of the nausea, which they may produce.

The *inhalation of the steam* of warm water, after the violence of the inflammation is subdued by blood-letting, has been found to afford considerable relief to the cough in many cases; but, in some, it has appeared to aggravate the distress.

One of the most pernicious pieces of practice, which is apt to be resorted to by the ignorant and inexperienced, is the administration of *opiates*, with a view to allay the cough, in the beginning of the disease. The effect of such medicines is directly the reverse; for they increase the oppression, and difficulty of breathing, and all the inflammatory symptoms. In a more advanced stage of the disease, however, when the highly febrile condition and the difficulty of breathing have been in a great measure subdued, and when the urgent symptom is an irritating cough, occasioned by the acrid mucus, and proving the chief source of the continuance of the pain and of want of sleep, a judicious employment of *opiates* often affords great relief. Although they moderate the cough, they actually promote expectoration, at this period of the disease: for, by occasioning a temporary stagnation of the thin fluid, which was diffused insensibly by frequent coughing, they produce a thickening, or what physicians have called a concocted state

PERIPNEUMONY.

state of the matter, which is more easily discharged. *Mucilaginous* and oily demulcents contribute in some measure, though in a much more trifling degree, to the same purpose, by allaying the acrimony of the mucus, which occasions too frequent coughing, and by befmeacing and defending the fauces from its irritation.

PERIPNEUMONY, *Bastard* or *Spurious*, the *Peripneumonia notha* of medical writers, was not very accurately distinguished till modern times; and the sagacity of Sydenham seems to have led him to the first diagnosis of the complaint. Nevertheless, even he left it under considerable obscurity, so that the term has been often employed without a definite acceptance. We shall first describe the symptoms, and then endeavour to point out the pathology of the disease.

The *peripneumonia notha* most commonly attacks persons that are somewhat advanced in life, and who are of a full phlegmatic habit, but most particularly those who have been frequently subject to catarrhal coughs, attended with much expectoration. It often makes its attack like the habitual catarrh, from which it cannot at first be distinguished. In other cases it comes on with languor, restlessness, and shiverings, alternating with fits of heat. The patient soon finds himself oppressed in his breathing, and complains of a sense of weight, soreness, and constriction in the chest, which is sometimes accompanied by an obtuse pain. The respiration is more frequent than natural, and is performed with a slight wheezing noise: and if the patient be desired to make a deep inspiration, and to expand the chest to its full capacity, his effort is either interrupted by a fit of coughing, or, if accomplished, his uneasiness is increased, and the pain, if any existed, is aggravated. At the same time with the difficulty of breathing, or soon after, a cough commences, which is often at first unaccompanied by expectoration; but this soon follows, and in many cases a considerable quantity of a white viscid mucus is brought up. The cough, when it becomes frequent and violent, is very generally attended with a peculiar rending head-ache, over the eye-brows, which is intolerably aggravated by every fit of coughing, giving a sensation, as Sydenham remarks, as if the head were torn in pieces.

The functions of the mind are in general but little disturbed in *peripneumonia notha*. There is often, however, a considerable degree of vertigo, accompanied with much flushing of the face, and not uncommonly a degree of drowsiness, which approaches to coma. The tongue invariably exhibits some deviations from the natural state, although it does not assume the dry coat of acute *peripneumony*. The digestive powers are at a stand; the patient is not merely indifferent to food, but he commonly loathes it as much as in idiopathic fever; he has thirst, but it does not appear to be urgent. The urine is constantly loaded, turbid, and high coloured. The pulse in this disease is not so correctly the measure of its urgency and violence, as in some others: it is always frequent, with some degree of sharpness; but it is at the same time small and feeble. The blood, when drawn, however, shews a buffy surface, as in other inflammatory affections.

There is often considerable uncertainty with respect to the prognosis of this disease. For although it often goes on like a common catarrh, of greater violence than usual, and, after the employment of some remedies, is entirely relieved by a free and copious expectoration; yet sometimes a violent exacerbation of the symptoms suddenly takes place, and terminates the life of the patient, when the previous indications of danger had not been very evident. Where the expectoration is free, although the excretion be copious, and when the breathing at the same time is little oppressed, a favourable issue may be commonly anticipated. But on the other hand, the disease often proves fatal in consequence of

a redundant secretion of the mucus, rapidly clogging up the bronchial passages, and producing suffocation. This occurs especially in those persons who are advanced in years, and whose lungs have been left in a relaxed state by previous attacks of the disease: for this complaint in a remarkable manner generates a predisposition to future attacks.

There is another termination of *peripneumonia notha*, which probably every practitioner has observed, and which has been well described by Dr. Badham. "It sometimes becomes," says this author, "the origin of a *spurious consumption*; and it is no uncommon thing to subdue the violence of the symptoms, and yet not to conquer the disease. The patient recovers, perhaps, a little strength, and leaves his bed, but his respiration is uneasy and oppressed. The cough and spitting, though mitigated in violence, continue to harass him: his pulse becomes more feeble and frequent, and a general debility takes place, attended with a decided loss of flesh. He becomes subject to irregular sweats, and in the course of a few months the emaciation often makes rapid advances. A person who sees this complaint after it is formed, and some time established, is ready to conclude, that he has to deal with *phthisis pulmonalis*; but if he be able to trace it from its origin, he will discern that it is an affection essentially different from consumption, however strong the resemblance in external character. There are also materials for diagnosis. The author has known patients in an extreme state of debility and emaciation, consequent to bronchial inflammation, distend the chest to its full capacity without feeling much uneasiness, and not any pain, because the substance of the lung is not diseased. They lie down in bed much more easily than consumptive patients, have no shooting pains in the chest, and though they sweat, there is nothing like that profuse discharge from the skin, which produces the solution of the hectic paroxysm. The appearance of the sputa might perhaps be taken into the account; but this cannot be exclusively depended upon." Badham, on the Inflammation of the Mucous Membrane of the Bronchiæ, p. 43.

The exciting causes of the *spurious peripneumony* are the same with those which produce the more common varieties of catarrh, namely, vicissitudes of the atmospheric temperature. The disease is, however, most frequent about the commencement of winter, when the cold suddenly sets in. We have had numerous opportunities of observing the effects of the sudden change of temperature, in the months of November and December, in producing this disease: and have seen the same individuals attacked, year after year, with a violent chronic catarrh, accompanied with a profuse excretion of mucus, until at last, as the lungs became more and more debilitated, the annual attack put on the character of *peripneumonia notha*, by which many such patients are carried off. The disease is most prevalent in damp and foggy seasons, and it is common during the occurrence of epidemic catarrh, or influenza.

Some difference of opinion has prevailed, as to the precise nature of the affection of the lungs, which constitutes the *spurious peripneumony*. Dissection of persons who have been destroyed by the disease, has always exhibited the bronchial cells and tubes loaded with a thick or puriform mucus, and commonly also bearing obvious marks of inflammation in the lining membrane. When this is considered, as well as the fact, that the disease is certainly often a common catarrhal affection at first, and that a catarrh is a mere inflammation of the mucous membrane of the bronchiæ, and, in old or relaxed habits, is frequently attended with a large excretion of mucus, little doubt can be entertained that the disease consists in an inflammation of the lining membrane of the

the bronchial passages and cells; in other words, that it is *bronchitis*, as Dr. Badham has correctly termed it. The disease, then, must be considered as differing from *catarrh* in the more extensive spreading of the inflammation, and in the more debilitated condition of the habit, and of the lungs in particular, of the patients in whom it commonly occurs. And it differs from *pleurisy* and *peripneumony*, inasmuch as the seat of the latter is confined to the parenchyma, or investing membrane of the lungs, the bronchial membrane being but slightly and secondarily affected. In like manner, perhaps, the inflammation of the mucous membrane, in *peripneumonia notha*, may, in its more acute degree, extend secondarily and partially to the parenchyma of the lungs, and thus produce an aggravated disease, in fact, a complication of the spurious with the true *peripneumony*.

The treatment of *peripneumonia notha* will of course be necessarily varied in different cases, in proportion to the age and vigour of the patient, and according as the symptoms approach more or less to those of the true *peripneumony*. When the inflammatory symptoms are considerable, indeed, the treatment in the two complaints differs only in degree.

In consequence of the great tendency to effusion, however, in all cases of the spurious *peripneumony*, and of the advanced age and relaxed habit of body in which it commonly appears, *blood-letting* must be employed with much caution. It is sometimes proper, indeed, to begin with a moderate *blood-letting*; but after the inflammatory symptoms have to a certain degree yielded, it is advisable to attempt the cure by an attention to diet, proper expectorants, and local evacuations alone. There are few complaints, indeed, in the treatment of which more caution and discrimination are required, the inflammatory symptoms often urging the necessity of one set of remedies, while the tendency to effusion points out another of very opposite effects. All that can be done in such cases, is to study with care the nature of the symptoms and the habit of body, and obviate that tendency which seems more immediately to threaten danger, but at the same time in such a way as shall as little as possible increase the opposite train of symptoms. The tendency to inflammation must be obviated with as little loss of strength as the nature of the case admits of; and that to debility, by means which tend as little as possible to excite irritation and increase inflammation. After all that can be said, therefore, much must depend on the discernment of the practitioner.

As general *blood-letting* can seldom be resorted to, without the risk of eventually increasing the complaint, we must endeavour to supply its place by the more assiduous use of local remedies, especially by local *blood-letting* and blisters. Where the disease approaches to the nature of *peripneumony*, *leeches* or *cupping glasses*, after scarification, may be applied to the chest. *Blisters*, however, are safe and useful in all cases, when applied to the thorax, and should not be omitted. The use of moderate *purgatives* seems to afford a safer mode of evacuation in *peripneumonia notha* than *blood-letting*. Dr. Cullen, indeed, is doubtful of their efficacy; but Sydenham assures us that, according to his experience, they are more useful than in the true *pneumonia*. The result of general experience, however, seems to be, that *mild cathartics* only, or *clysters*, are proper in this disease; for, although it is of great consequence to prevent irritating matter from lodging in the alimentary canal, yet much or frequent evacuation is found hurtful.

The beneficial effects of *emetics* in this complaint, in which the freedom of the expectoration is a matter of great importance, might be anticipated, and experience confirms the expectation. Nor is their tendency to promote perspiration, which, if general and not profuse, nor brought out by heat-

ing measures, is far the most favourable, to be overlooked. With respect to the other medicines, denominated *expectorants*, which are often recommended in these bronchial affections, we have already stated how little efficacy they possess, which merits the appellation. (See EXPECTORANTS.) The more stimulant articles of this class, such as the foetid gum-resins, ammoniac, *assa foetida*, &c. may be productive of some benefit as tonics, in the convalescent state of the complaint, but they are too heating to be admissible, where the inflammatory condition is still present in any degree. The *ipecacuanha*, or the squill, in its preparation with vinegar, are more applicable; but they are, perhaps, chiefly efficacious by the degree of nausea which they excite, and therefore rather belong to the class of emetics.

Where the mucus excreted is extremely thick and viscid, the inhalation of the steam of warm water contributes to facilitate expectoration, by diluting the sputa. Little, however, is to be expected from ground-ivy, hyssop, and some other popular pectoral medicines. If they produce any actual alleviation of the cough, it is probably merely in consequence of the mucilage which they contain, which, like the various emulsions, liquorice, sugar-candy, &c. relieve the irritation of the cough, by besmearing the fauces, and shielding the passages from the acrimony of the mucus.

Paregorics, which are in fact *opiates*, are too often resorted to injudiciously in this disease, and it is necessary to enforce much caution with respect to the employment of these medicines in spurious *peripneumony*. They act by lessening the sensibility of the diseased parts to the irritation of the accumulating excretions of the lungs, and thus interrupt for a time the efforts to expectorate, and at the same time they interpose, as it were, a veil between the actual state of disease and the observer, and deceive him as to the quantity of the excretion. But the great evil is, that, during the interruption to expectoration which opium occasions, if the fluid be still copiously poured into the bronchial passages, and the strength be much reduced, the lungs become clogged up, beyond the powers of the patient to unload them, and the danger of actual suffocation is aggravated, or absolutely brought on. It is only, therefore, after the inflammatory affection, and the febrile state of the constitution is gone, and nothing but irritability remains, that opiates may be used at the discretion of the practitioner.

Where the strength appears to be much sunk, cordials and stimulants can scarcely be ventured upon, so long as any inflammatory symptoms remain: preparations of the bark are generally hurtful, and even wine, diluted with water, though less irritating, can only be admitted in cases, when the patients, as often happens, have been long habituated to the use of stimulating liquors. The only safe mode of supporting the strength, is by the cautious but assiduous administration of light, liquid, vegetable food. For so long as any fever remains, the antiphlogistic regimen is indispensably required. See Cullen, First Lines, sect. 376. Wilson, on Febrile Diseases, vol. iv. chap. 11. Badham on Inflammations of the Bronchiz, chap. iii. Also, Boerhaave, Aph. 867, with Van Swieten's Commentary; Sydenham, Op. sect. vi. cap. 4. Morgagni, de Sed. et Causis Morbor. epist. xxi. art. 11—15.

PERIPOLIUM, in *Ancient Geography*, a town of Magna Græcia, in the part called Brutium. It belonged to the Locrian-Epizephyrians, on the banks of the small river Alex or Halex.

PERIPTERE, Περπτερε, formed of περι, *about*, and πτερον, *wing*; *q. d.* winged on every side, in *Ancient Architecture*, a building encompassed on the outside with a series of

of infulate columns, forming a kind of ille, or portico, all around.

Such were the basilica of Antonine, the septizon of Severus, the portico of Pompey, &c.

Peripteres were properly temples which had columns on all the four sides; by which they were distinguished from prostyle, and amphiprostyle, the one of which had no columns before, and the other none on the sides.

M. Perrault observes, that periptere, in its general sense, includes all the species of temples which have porticoes of columns all around, whether the columns be diptere, or pseudo-diptere, or simple periptere; which is a species that bears the name of the genus, and which has its columns distant from the wall by the breadth of an inter-columnation. For the difference between periptere and peristyle, see PERISTYLE.

PERIPYEMA, from περι, and πυσι, pus, in Surgery, a collection of matter around any part.

PERIRRHANTERION, περιρραντηριων, in Antiquity, a vessel usually of stone or brass, filled with holy water, with which all those that were admitted to the sacrifices were sprinkled, and beyond which it was unlawful for any one that was βεηηλοσ, or profane, to pass. Some say it was placed in the αδυτον, or inmost recess of the temple, into which none entered but the priest; but Casaubon will have it to be placed at the door of the temple, which opinion seems more probable, because all persons who were αβειηλοι, or unpolluted, were permitted to pass beyond it.

PERIRRHEUSA, in Ancient Geography, an island placed by Pliny on the coast of Ionia, a province of Asia Minor.

PERISABORA, a town of Asia, in an island of the Euphrates, according to Ammianus Marcellinus. Zosimus calls it Bersabora, and says that it was well fortified, and that it was not inferior in grandeur to Ctesiphon. It was situated S.E. of Sippara.

PERISBA, in Geography, a town of Persia, in the province of Irac; 50 miles S. of Hamadan.

PERISCEPASTRUM, from περι, and cepastrum, a wild onion, denotes, in Surgery, a particular bandage, which encircles the head in successive folds, like the layers of that bulbous root.

PERISCII, περισκιοι, q. d. circumumbres, of περι, about, and σκια, shadow, in Geography, those inhabitants of the earth, whose shadows do, in one and the same day, successively turn to all the points of the horizon.

Such are the inhabitants of the frozen zones, or those who live within the compass of the arctic and antarctic circles; for as the sun never goes down to them after he is once up, but moves always round about, so do their shadows; inasmuch that, in the same day, they have their shadows on all sides.

PERISCYLACISMUS, περισκυλακισμοσ, a method of purification in frequent use among the Greeks. It was done by drawing a whelp round the person to be purified.

The word comes from σκυλαξ, a whelp.

PERISCYPHISMUS, from περι, and κυφος, gibbous, in Surgery, an incision made across the forehead, or from one temple to the other, over the coronal suture, formerly practiced in considerable inflammations of the eyes. The lips of this wound were kept asunder with lint, and when the disorder abated, the denuded bone was rasped, and the wound healed. P. Ægineta. lib. vi. c. 7.

PERISSACHOREGIA, a term found in the Code, about the meaning of which authors are much divided.

Alciat, and some others, will have it to be the name of an office; viz. that of curator of the annona, or provisions,

from περισσεια, abundance, and χορηγειν, to lead, or bring. Others take it to be the office of a magistrate, who was to look to the augmentation of the annona, and the distribution of the same. Dom. Macri will have it to signify a donative, or distribution made to the soldiers, over and above their pay, See DONATIVE.

PERISSOLOGY, περισσολογια, in Rhetoric, a quality of style directly opposite to brachylogy, and is otherwise called macrology. See MACROLOGY, BRACHYLOGY, and DICTION.

PERISSON, in Botany, a name given by the ancient Greeks, and afterwards by the Romans, in the time of Pliny, to a kind of nightshade, which makes those people who took it internally run mad. It was also called pentadryon, and anhydron, and by some manicum strychnum, or simply manicum.

PERISSOSIS, a word used by Hippocrates to express a redundancy of humours.

PERISTALTIC, in Anatomy, from περισπλλω, to contract, a term applied to the motions of the alimentary canal, by which its contents are carried forwards or backwards. See INTESTINE.

PERISTAPHYLINUS, a name given by some writers to two muscles of the soft palate. The peristaphylinus externus is the circumflexus palati; the internus is the levator palati. See DEGLUTITION.

PERISTAPHYLO-PHARYNGEUS, a name given by Winslow to some fibres of the constrictor pharyngis superior. See DEGLUTITION.

PERISTERITES, the Pigeon-stone; in Natural History, a name given by some whimsical people to an odd conformation of a pebble, which they suppose to represent very exactly a pigeon without its wings. It seems to have been a mere lusuf natura, in the formation of a common pebble. The variations of figure in the common pebbles are so infinite, that a person of a fertile imagination might find resemblances to all the parts of the creation in the stones of a single gravel-pit. The giving names to such accidental things is not only unnecessary, but mischievous, as it causes great confusion in natural history.

PERISTERNA, in Anatomy, is used for the lateral parts of the thorax.

PERISTIARCHUS, περισπρχοσ, in Antiquity, a name given to the person that officiated in a lustration.

The word comes from περισπα, another name for κθαριμσπο.

PERISTOMA, in Anatomy, a word used by authors to express the villous coat of the intestines.

PERISTOMIUM, in Botany, from περι, about, and σωμα, the mouth, because it encircles the orifice of the capsule; see FRINGE of MOSSES.

PERISTYLE, περιστυλοσ, formed from περι, about, and στυλοσ, column, in Ancient Architecture, a place or building, encompassed with a row of columns on the inside; by which it is distinguished from the periptere, where the columns are disposed withoutside.

Such was the hypæthre temple of Vitruvius; and such are now some basilicas in Rome, several places in Italy, and most cloisters of religious.

PERISTYLE is also used by modern writers for a range of columns, either within or without a building.

Thus we say, the Corinthian peristyle of the portal of the Louvre, &c.

PERISTYLION, περιστυλιον, among the Athenians, a large square place, though sometimes oblong, in the middle of the gymnasium, designed for walking, and the performance

of

of those exercises which were not to be performed in the palaestra.

PERISYSTOLE, περισυστολή, in *Physiology*, the pause or interval between the two motions of the heart, or pulse; viz. that of the systole, or contraction; and that of the diastole, or dilatation.

PERITAS, in *Geography*, an island in the Spanish main; 10 miles W. of Cumana bay.

PERITHE, a name by which some of the writers of the middle ages have called the *pyrites*; they say it has great virtues against the gout; some of them also have called it the *lapis peridonius*.

PERITO, in *Geography*, a town of Naples, in Abruzzo Ultra; 16 miles W.S.W. of Celano.

PERITONÆOREXIS, from περιτόναιον, the *peritoneum*, and ῥήσσω, to break, in *Surgery*, a bursting of the peritoneum.

PERITONEUM, in *Anatomy*, (περιτόναιον, Gr. from περιτείνω, to stretch round,) the serous membrane which lines the abdomen, and covers the viscera contained in that cavity.

The abdomen or lower belly is a large cavity, containing the organs concerned in digestion, in the secretion and excretion of urine, and part of those employed in generation. It occupies the part of the trunk comprehended between the chest and the lower extremities. We have to consider, in the anatomy of this part, the containing parts, sides, walls, or *parietes*, as they are technically termed, and the contained organs, or the abdominal viscera.

The figure of the abdomen, viewed altogether, hardly admits of any general description; more particularly on account of its connections with the chest above, and the limbs below, which obscure its outline. We may distinguish, on the external aspect, an anterior and posterior, a superior and inferior, and two lateral regions.

The anterior region, called the belly in common language, is oblong and convex, particularly below. The whole of this division being formed of muscles and other soft parts, its figure is subject to all those changes, which the motions of the abdominal viscera in respiration, and in the various movements of the trunk, and the numerous alterations in the bulk of the organs, according as they are full or empty, must produce. The convexity of the belly is the least, when we lie horizontally on the back: it is increased in the erect attitude, because the pelvis altogether is bent backwards in relation to the upper part of the trunk; and it is still greater in the kneeling posture, because the spine is then more bent backwards, and the abdominal viscera thrown forwards. The abdominal muscles, particularly the recti, are thrown into an unpleasant state of tension in the latter position. When air is taken into the chest, the abdominal viscera are thrust forwards, so as to make the belly more prominent; and it falls again when air is expelled in expiration.

The middle and upper part of this region presents a superficial depression, called the *scrobiculus cordis*, or pit of the stomach: and a little below this, on the middle line of the abdomen, is a more or less depressed cicatrix, called the navel or umbilicus.

The front of the abdomen is subdivided into three regions; a superior, middle, and inferior, called the epigastric, umbilical, and hypogastric. The first begins at the end of the ensiform cartilage, and extends to the level of a line drawn from side to side, between the most prominent points of the inferior boundary of the chest. The middle of this region is properly called the epigastrium, while the lateral divisions, covered by the ribs, are named the right and left hypochondria. The umbilical region reaches from the lower boundary

of the epigastric to the level of a line drawn between the two cristae of the ossa innominata: the lateral portions of this division are called the flanks or sides. The remainder of the abdomen, below the line last mentioned, is the hypogastric region: this is sometimes divided into an upper and a lower: the middle of the former is the hypogastrium, and the sides are the ilia: the middle of the latter is the region of the pubes, and the sides are the groins or inguina. The arbitrary distinctions first indicated may be clearly shewn, by placing four ribbons on the body: two transversely, of which one crosses at the lower edge of the ribs, and the other at the cristae of the ossa innominata; and two perpendicularly, from the anterior and superior spines of the ossa innominata to the edges of the chest. Thus the front of the abdomen will be divided into the nine parts enumerated already.

The posterior region consists of two parts. The superior, called the loins, presents a middle depression, corresponding to the spinous processes of the lumbar vertebrae, and two lateral elevations, produced by the masses of the spinal muscles. The lumbar region, however, taken altogether, is concave from above downwards: this concavity is least in the recumbent posture, increases when we stand up, and is more considerable in proportion as we bend the chest backwards. The lower comprises two rounded prominences, formed by large masses of muscle, covered by a thick stratum of fat, and called the buttocks. They are separated from each other by a longitudinal depression leading to the anus; and each is bounded below by a large fold, which distinguishes it from the rest of the thigh.

The upper region is not perceived externally; it is formed by the diaphragm, and corresponds exactly to the basis of the chest. We have only to state here that it is convex, and slightly divided at the middle into two prominences; and that it is much higher in front than behind, rising as high as the ensiform cartilage, and even above it in the former aspect, and slanting from this to the last ribs and lumbar vertebrae in the latter. For a more particular account of the form and relations of this boundary of the abdomen, which separates it from the chest, see **DIAPHRAGM**.

The lateral regions are much less extensive than the anterior and posterior, with which they are continuous, and are defined by the lower edges of the ribs and the cristae of the ossa innominata. They are concave from above downwards, and convex from before backwards; and, as the sides of the abdomen are here, as in the front, formed by muscles, they are subject to changes from the same causes. The concavity is greater in the standing or upright, than in the recumbent posture. Above the lower edge of the ribs, the cavity of the chest begins; but the surface of the diaphragm lies in contact with that of the ribs, although they are both covered by the pleura, and the convexity of the upper region of the abdomen rises into the chest, and is covered behind and at the sides by the latter cavity. Hence a sharp instrument would pass in the intervals of the lower ribs, and through the diaphragm into the abdomen, without wounding the lung. See **LUNG** and **DIAPHRAGM**.

The inferior region of the abdomen presents at the two sides the attachments of the lower limbs; and in the middle, the generative organs and anus. The space between the two latter is called the perineum. (See **PERINEUM**.) The generative organs and anus are described under **GENERATION** and **INTESTINE**.

The abdominal parietes present the same regions on the inside: the anterior, covered throughout by the peritoneum, is concave and smooth, and contiguous to the abdominal viscera. The posterior affords attachments to the various viscera;

PERITONEUM.

viscera: when these are removed, it presents a middle column, formed by the lumbar vertebræ, and supporting the aorta and vena cava; and two broad and deep lateral depressions, which end below in two wider excavations, formed by the superior expansions of the ossa innominata, and called the iliac fossæ. The lateral regions are narrow, concave, and smooth, and continued uninterruptedly with the anterior and posterior. The superior, formed by the concavity of the diaphragm, is concave, and corresponds to the liver, stomach, and spleen. The inferior consists of the excavation of the pelvis; a rounded hollow, constituting a kind of appendix to the abdomen, and lodging the rectum and bladder, the vagina and uterus, with its appendages.

The boundaries of the abdomen, at the back and lower parts, consist of the vertebral column and pelvis, which may be regarded as fixed points; the motion of which they are capable not affecting the dimensions of the cavity. In the rest of the extent, the coverings are muscular, and capable of changing both the form and size of the part to a considerable degree. (See OBLIQUUS.) The bones belonging to the abdominal parietes are the lumbar vertebræ, sacrum, coccyx, ossa innominata, with their connecting ligaments and fibro-cartilages; the false ribs, and their cartilages: to these we may add the ensiform cartilage. The front and sides of the cavity are formed by the obliqui externi and interni, the transversi, recti, and pyramidales: at the back part we have, forming the immediate surface of the cavity, the iliaci interni and psoæ, the quadrati lumborum, and crura of the diaphragm: nearer to the surface, the multifidi spinæ, the sacrolumbales and longissimi dorfi, the obliqui interni and transversales, the serrati postici inferiores, and the latissimi dorfi: above, the abdomen is bounded by the diaphragm, which separates it from the chest: at the lower part are the following muscles; *viz.* the levatores ani, the coccygei, transversi perinei, acceleratores urinæ, and obturatores; to which might be added those which cover the pelvis.

The arteries in the abdominal parietes are the internal mammary, the epigastric, circumflexæ ilii, inferior intercostal, lumbar, iliolumbar, lateral sacral, obturatrices, pudendal, and gluteal. These are accompanied by corresponding veins. The absorbing vessels cannot be particularly enumerated.

The nerves are the diaphragmatic, dorsal, lumbar, and sacral.

These parts are covered externally by the skin, which is considerably thicker on the back than on the front aspect. Internally they are lined by the peritoneum, which we shall describe below.

There are several openings in the sides of the abdomen. On the front we have five, *viz.* the umbilicus, the two abdominal rings, and the crural arches. (See OBLIQUUS.) In the diaphragm there are three, for the vena cava inferior, the œsophagus and par vagum, and the aorta and thoracic duct. (See DIAPHRAGM.) Below, there are two for the obturator vessels and nerves, and as many for the sciatic nerves, and large vessels going to the buttock and hip.

The space circumscribed by the abdominal parietes described above represents an oval, of which the large end is turned upwards, and the point downwards. Its size is accommodated to that of the contained viscera, and undergoes commonly only those changes which the varying quantity of their contents can produce. The figure of its boundaries, we have already mentioned, is constantly changing from the process of respiration; in which the alterations affect only the superior and anterior, very seldom the lower boundary. But the yielding nature of its sides enables the abdomen to

increase considerably under various circumstances, as in pregnancy, in the accumulation of fat in the corpulent, in ascites, &c. The front is the part most affected in these enlargements; the abdominal muscles, particularly the recti, becoming distended to a vast amount. The sides are not much enlarged; the upper boundary also gives way in those cases, enlarging the abdomen at the expense of the thorax: hence the affection of the respiratory organs in the latter stages of pregnancy, and ascites. When the distending cause has ceased to act, the sides of the cavity have the power of recovering their former size.

The viscera contained in the abdomen may be arranged in three classes: the digestive, urinary, and generative. Those of the first class are the stomach, the small intestine, the large intestine, the liver and gall-bladder, the spleen, pancreas, and the omenta. The second are the kidneys, renal capsules, ureters, and urinary bladder. The third, in the male, the spermatic chords, vasa deferentia, and vesiculæ feminales; in the female, the vagina, and the uterus, with its ligaments, ovaria, and Fallopian tubes.

The peritoneum is a serous membrane, which, besides lining the cavity of the abdomen, covers the surfaces of most of the contained viscera, and forms, in order to arrive at these viscera, duplicatures or folds which fix them in their situation, and convey to them their vessels and nerves. In order to convey a notion of its arrangement with respect to the viscera, it has been compared to a bag without an opening, of which the superior, anterior, and lateral parts are not more extensive than is sufficient for covering the corresponding portions of the parietes; while the back, very large, not only covers the posterior part of the cavity, but is applied over the viscera, furnishing them an external investment. Hence it follows, that if it could be dissected off from all the viscera, we should have a large and entire bag, and see clearly that they are all on the outside of the bag.

We shall proceed, in the next place, to trace the course of the peritoneum, and follow it in the formation of its different folds.

It lines the concavity of the diaphragm, and passes from the posterior and inferior edge of the greater muscle over the appendices, the psoas, the lumbar vertebræ, aorta and vena cava, the spermatic vessels, the renal capsules, kidneys, and ureters. The three viscera last mentioned are behind the bag, and separated by it from those contained within the peritoneal cavity. It then lines the great hollows of the ossa innominata, covering the iliaci interni muscles and spermatic chords, and descends into the pelvis, covering the rectum entirely above, and about one-half of it below. From the sides of the rectum it is produced over the sacrum, the ossa innominata, the internal iliac vessels and great nerves, the obturatores interni, coccygei, and levatores ani. At about two inches from the anus, it is reflected from the upper surface of the rectum to the lower part of the vagina, and covers its posterior half. It ascends over the back of the uterus, and its appendages, envelopes the fundus uteri, and front of the organ, and is then reflected from the front of the cervix to the posterior and inferior part of the bladder. It mounts over the back of that organ, and descends a little from the fundus, particularly if it be full, to the back of the pubes; if it be empty, the membrane ascends from the bladder to the bone. Between the rectum and the vagina there is consequently a small process of peritoneum, forming a cul-de-sac, at the mouth of which there are two lateral folds more or less prominent: the end of this cul-de-sac is the most depending part of the peritoneal cavity. A similar but shorter pouch, terminating also in a blind end, is formed between the uterus and bladder, and there are two lateral

PERITONEUM.

folds connecting these organs. In the male, too, the peritoneum passes over the vasa deferentia. The corresponding cul-de-sac in the male subject is between the bladder and rectum. Where the rectum descends from the fundus of the bladder to the front of the abdomen, a third kind of process is formed. Further descriptions of these parts will be found in the articles GENERATION and KIDNEY. As the membrane passes from the bladder to the abdominal parietes, it forms three folds, including the umbilical arteries and uterus. See KIDNEY.

In the iliac fossæ the peritoneum is continued over the large intestine, covering the cæcum on the right, and the sigmoid flexure of the colon on the left side. To the latter it furnishes a loose fold, continuous with that which the rectum has in the pelvis; but it binds the former closely in its situation. (See INTESTINE.) The membrane is then continued on each side into the lumbar region. From the bladder and pelvis the peritoneum rises to bound the front of the abdominal cavity, and lines the back of the recti, and the internal surface of the transversi, and then reaches the edge of the diaphragm, the point from which we commenced the description.

Thus a large membranous bag is formed, simple and oval above, and ending in a single, double, or triple processes below; viz. the productions between the rectum and bladder, between the bladder and uterus, and vagina and rectum, and between the bladder and pubes, where it exits.

The folds of the peritoneum have been partly mentioned in this article: they are all particularly described, with the viscera to which they belong, in the various parts of this work. We have only to notice a few of them here shortly.

On the left side of the diaphragm the peritoneal lining extends, without producing any process, backwards to the spine: then it is prolonged over the splenic vessels and the spleen, reaches the great end of the stomach, and is continued with the anterior layer of the great omentum: with the peritoneum of the lumbar region it forms a small fold under the anterior end of the spleen. At the œsophageal opening of the diaphragm, the membrane passes over the front of the stomach.

On the right side of the diaphragm the peritoneum forms folds, connecting the liver to its surface, and called the ligaments of the liver. (See LIVER.) From the concave surface of this organ, the peritoneum extends to the small curvature of the stomach, under the name of the little omentum. (See EPIPLOON.) Under the edge of the latter process is an opening, called the foramen of Winslow, leading into another peritoneal cavity, in front of the vertebral column, behind the stomach, and above the transverse mesocolon, having no other communication with the general cavity. If we suppose the peritoneum to enter at the opening just mentioned, we may trace it forming the back of the little omentum, then over the back of the stomach. Uniting to the front layer on the stomach, it forms the anterior lamina of the great omentum. This, after covering the arch of the colon, and the small intestines, is reflected on itself to form the back layer, which is fixed to the arch of the colon, and is continuous with the transverse mesocolon. The latter fold is composed of two layers; the superior of which goes in front of the duodenum, the pancreas, the vena cava, and the appendices of the diaphragm, to the opening, from which we commenced the description. For a more particular account of all these parts, see EPIPLOON. The inferior layer of the transverse mesocolon goes over the lower part of the duodenum, and then is continued on the back of the abdomen.

In the lumbar regions the peritoneum is continued over the ascending and descending colon, without forming any thing like a mesentery: it also covers here more or less of the kidneys. Having enveloped the colon, it forms in the middle of the abdomen, extending obliquely from above downwards, and from left to right, the broad fold that covers the small intestine, called the mesentery. See INTESTINE.

The peritoneum, like all serous membranes, has two surfaces; an external adherent one, and an internal, which is free. The first is applied to the sides of the cavity, and to the different viscera; and, where folds are formed of two layers, these are applied to each other. The adhesion of the membrane to any of the parts just mentioned is not uniform. To the liver, spleen, stomach, and intestines, (excepting a part of the duodenum,) it is most closely and almost inseparably connected. The union is much less firm in the case of the pancreas, bladder, uterus, and vagina. To the tendons of the transversi, and of the diaphragm, the connection of the membrane is most intimate: it can hardly be separated entire. The adhesion is much less firm to the diaphragm, and to the muscular fibres of the transversus. But the loosest attachment of all is in the lumbar regions, in front of the vertebral column, and about the pelvis, where a copious and easily lacerable cellular tissue joins it to the neighbouring parts. This structure allows the pus of abscesses to pass from one part to another, as in the psoas abscess, &c. Above the pubes, and behind the recti, there is much loose cellular tissue, which allows the peritoneum to quit these muscles, and apply itself on the bladder, when that organ, in its dilated state, ascends into the cavity of the abdomen. At the opening for the vena cava, the peritoneum is separated from the pleura only by cellular tissue; the two membranes are also near together at the œsophageal and aortic orifices of the muscle. At the side of the ensiform cartilage, and the lower edge of the fibres of the diaphragm, arising from the last rib, the two membranes come in contact.

Wherever there is much cellular tissue on the surface of the peritoneum, it contains more or less fat. This fluid is also copiously deposited in most of the folds of the membrane.

The free surface of the membrane is distinguished by no peculiar character; as in all other serous membranes, it is perfectly smooth, and moistened by an exhalation, which merely gives a lubricity to the parts during life, but is visible in the form of actual fluid after death.

Unnatural adhesions, the consequence of inflammation, are much more rare here than in the pleura. Can we explain this phenomenon, by the more numerous and extensive motions of the abdominal contents? In the violent exertions of the body, in respiration, in the natural execution of the digestive functions, &c. the relations of the different parts to each other, and to the sides of the cavity, are incessantly changing; and they correspond to each other only in small points, on account of their rounded outlines. Where there is less motion, as in the upper part of the cavity, between the liver and spleen and the diaphragm, or in old irreducible herniæ, adhesions are much more common.

The peritoneum is thin, like all organs belonging to the serous system. It is thickest about the loins, and the sides of the abdomen; thinner in the folds attached to the viscera, and very thin on the liver, spleen, stomach, and intestines. In the omenta its tenuity is extreme. It is diaphanous, and consequently allows the colour of the subjacent organs to appear through it.

On its organization, properties, and uses, we have nothing

thing to add to the general account of these subjects in the article MEMBRANE.

In the fish kind, the peritoneum, or membrane furrounding the abdomen, is very variously coloured. In some it is of a shining silvery whiteness, as in the cyprini, perch, efoes, &c. In others it is of a fine pale flesh-colour, as in the salmon; and in some it is wholly black, or else variegated with very numerous black spots, as in the clupeæ, gadi, cotti, and spari.

PERITONITIS, in *Medicine*, an inflammation of the *peritoneum*, or membrane lining the cavity of the abdomen, and investing all its viscera, and also extending itself to form the omentum.

As the peritoneal membrane occurs in these three situations, somewhat distinct from each other, though still but a continuation of the same structure, Dr. Cullen divided the disease into three species; 1. The peritonitis *propria*, when the inflammation is seated in that part of the membrane strictly so called, which lines the parietes of the abdomen; 2. Peritonitis *omentalis*, when it is seated in the omentum; and 3. Peritonitis *mesenterica*, when it is seated in the investing membrane of the mesentery. The symptoms and method of treatment requisite for their cure are nearly the same under all these forms, and we shall treat of them under the same head.

It must be premised, however, that the peritoneum is subject to two kinds of inflammation; the one acute, and accompanied by symptoms of violent constitutional disturbance, which is the proper peritonitis of authors; the other of a more *chronic* form, which we shall describe separately.

§ 1. *The acute peritonitis* generally commences, like the other visceral inflammations, with chills and shiverings, though these are sometimes slight, and occasionally absent altogether: the pulse becomes quick and frequent; there is considerable thirst; and the general affection, called fever, ensues. These symptoms are attended from the very beginning with a sense of heat and pain in the abdomen, at first generally confined to some one part, though sometimes diffused over the whole of its surface. This pain is much increased by pressure, or, in other words, there is a great tenderness or soreness of the belly; but it is not accompanied by any inclination to go to stool. The pulse is at least one hundred in a minute, and small; yet the tongue is not much altered at first from its natural appearance.

In the course of twenty-four hours, however, the pain and tenderness on pressure increase, so that even the weight of the bed-clothes sometimes becomes intolerable, and the pulse rises to a hundred and twenty or thirty in a minute: at this time the tongue begins to be covered with a cream-coloured mucus, and, though it is moist, there is great thirst. A considerable degree of tension and swelling now takes place over the whole abdomen, and the patient finds most relief from pain by remaining motionless upon the back, with the knees in a small degree elevated. This position, while it throws the weight of the intestines to the spine, and therefore removes the pressure of them from the inflamed membrane, at the same time relaxes the abdominal muscles, and prevents any stricture over the outer surface of the inflamed part. As these muscles are called into action by any attempt to rise or even to turn, so such a motion necessarily aggravates the acute pain; whence absolute rest, as just stated, is most easy to the patient. The tension of the belly continues to increase to the sixth, seventh, or eighth day, on one of which days, unless proper measures have been taken to remove the disease, the patient most commonly expires. Previous to death, the pain often suddenly ceases, and the inexperienced may conceive that this is an indication

of amendment in the disease: but if the symptoms be minutely examined, it is found that, at the same time, the pulse is sinking in strength and increasing in rapidity, that the strength of the patient is also sensibly diminished, the countenance collapses, cold clammy sweats break out, the extremities lose their vital warmth, and at length a laborious respiration manifests the concluding struggle of life.

A favourable prognosis, however, is to be deduced from a gradual cessation of the pain, especially when it is accompanied by a diminution of tension and soreness, and when at the same time the pulse becomes fuller and less frequent, the skin less parched, soft, and moist, the respiration less laborious, and the countenance more open and expressive of ease.

Inflammation of the peritoneum may be distinguished from *colic* by the permanency of the pain, and the frequency of the pulse, as well as by the tenderness on pressure, even before any tension of the abdomen has taken place; and by the absence of any inclination to go to stool, when the pain is severe, as well as by the undiminished suffering, when an evacuation of the bowels is effected, either spontaneously or by medicine. It is not so easily distinguished from inflammation of the bowels or *enteritis*. In this latter disease, however, there is obstinate constipation, and the pain is more acute, and not so much aggravated by external pressure; the stomach is also commonly affected with vomiting. See *COLIC* and *ENTERITIS*.

The *appearances* which present themselves *on the dissection* of persons who die of peritoneal inflammation, are, a redness of that membrane, which is crowded with a number of very small vessels, carrying a florid blood, and also considerably thickened, more pulpy, and less transparent than natural. When a portion of the inflamed peritoneum is separated from the abdominal muscles, there is commonly no appearance whatever of the inflammation having spread into the muscles; but where the peritoneum covers the intestinal canal, the inflammation is sometimes found to have penetrated not only into the muscular coat of the intestines, but even into the villous membrane. The reason of this difference probably is, that the peritoneum is less connected with the abdominal muscles than with the intestinal canal, so that the inflammation passes more readily from the peritoneum to the former than the latter.

The inflammation of the peritoneum is sometimes found to have been slight and partial; at other times great and universal. When it is slight, and affects that part of the membrane which is connected with the intestinal canal, it often forms broad bands of inflammation, which run along the course of the intestines, and are bounded by the contact of the different portions of the intestines among themselves. In this case, the coats of the intestines are not thicker than usual, the inflammation being slight, and confined to the peritoneum itself. Where the inflammation is great, the intestines are much thicker and more massy. This evidently arises from the greater accumulation of blood in the small blood-vessels, as well as from the extravasation of fluids into the substance of the intestines, in consequence of the strong inflammatory action of the vessels. The *mesentery* and *mesocolon* are much thicker than in their natural state, and there is also a remarkable change in the *omentum*. It is frequently as thick as a person's hand, and lies as a circumscribed mass along the great curvature of the stomach. The principal cause of this change in these parts is the extravasation of the coagulable lymph into the cellular membrane between the laminæ of the peritoneum which form them.

Besides these appearances, there is in many places thrown out a layer of a yellowish pulpy matter, gluing different portions

PERITONITIS.

portions of the viscera together. This is sometimes a thin layer; at other times it is of considerable thickness; and appears to be the coagulable lymph of the blood. There is also a considerable quantity of a brownish fluid in the cavity of the abdomen, resembling the serum, which is mixed with small shreds of the coagulable lymph, and sometimes with pus, giving it a turbid appearance. The quantity of coagulable lymph and of the fluid is sometimes large, in proportion to the degree of inflammation: and, in some instances, instead of serum, a large quantity of pus is found. The stomach and intestines are also frequently found distended with air, which had accumulated in the progress of the disease.

The causes of peritoneal inflammation are perhaps the same with those which give rise to enteritis: but there is one cause of this inflammation, which is peculiar to women, and is some state of the uterus after parturition; whence this disease has been called, when occurring at that period, *puerperal fever*. It occurs, however, both in men, and in women who have not been pregnant.

Of the Cure of Peritonitis.—The nature of the disease being once ascertained, the method of cure will be obvious. As in all other acute inflammations, *blood-letting* from the system at large is the remedy to be principally depended upon, and should be resorted to at as early a period as possible. Sixteen ounces of blood or more should be taken from an adult, and a proportionably less quantity from a patient not arrived at that age. The chief guide in directing this operation must be the degree of pain expressed by the patient, particularly under the action of pressure: and if this should not be diminished in eight hours from the former bleeding, the same quantity of blood should be taken away again. Soon after this second bleeding the pain will generally be found to be less acute; but it may still be right to apply ten or a dozen leeches to the abdomen, and as soon as these have done their office, its whole surface should be covered with a blister. It is to be distinctly understood, however, that neither leeches nor blistering should be trusted to, until some diminution of pain have actually been produced by the general bleeding. And farther, if it should happen, that the pain is not diminished after the second bleeding, this operation must be repeated even to the fourth or fifth time, after intervals of ten or twelve hours each, if the strength of the patient is at all able to support it. If it should be unequivocally manifest at any one of these bleedings, that the strength of the patient is inadequate to the loss of sixteen ounces, a smaller quantity may be taken away, and we may resort, at the same time, to the topical application of leeches and blisters.

It seems preferable to delay the application of a blister till the constitutional effects occasioned by the local inflammation are partly removed by the general bleeding, and till the disorder is thus reduced to a state more nearly approaching to a more simple topical affection. For by proceeding thus, the double advantage will be obtained, of applying the topical remedies at a period, when their influence will be exerted with the greatest effect, and the practitioner moreover will not be deprived of the only means of ascertaining the variations of the disorder; namely, by pressure on the abdomen. The first symptom on which we may pronounce the recovery of the patient, is the ability of remaining in a sitting posture, after he had previously been confined to the back: this position of the body proves that the inflamed peritoneum is now able to bear the weight of the bowels, which perhaps never takes place where the patient does not recover.

With respect to internal medicine, it is of secondary im-

portance. Nevertheless it is necessary that the bowels should be kept open, and this should be effected with as little irritation as possible. For this purpose castor oil, or small doses of the sulphate of magnesia, may be administered with advantage; and emollient glysters may be injected, which, at the same time that they procure stools, will act as internal fomentations. Fomentations may be also applied externally to the abdomen, when the tenderness is sufficiently removed to admit of the pressure. It is scarcely necessary to add that the strictest antiphlogistic system must be adopted, both in respect to diet and medicine.

It may be right to mention an irregularity in the complaint, which is apt to mislead the practitioner, and to deter him from resorting to those vigorous measures, so essential to counteract the magnitude of the danger. There is now and then, at the very first attack, so great a degree of prostration of strength, accompanied likewise by a pulse scarcely perceptible at the wrist, as might induce us to consider the patient at the point of death, and unequal to undergo the treatment above recommended. The appearances, however, seem to arise wholly from the inflammation extending to the peritoneal coat of the stomach and intestines. Here, as in different circumstances, the pain or pressure must be the criterion to determine our practice; and if the pain should be found exquisite, no accidental symptom should lead us from trusting for relief chiefly to the lancet. Such a decision will soon be justified by a freedom in the action of the arterial system, the pulse becoming fuller and stronger, by an abatement of the languor and prostration of strength, and by a diminution of pain. See Pemberton on Diseases of the Abdom. Viscera, chap. i. Baillie's Morbid Anatomy, chap. vi.

§ 2. *The chronic peritonitis* was but cursorily noticed by medical writers, until the attention of the profession was called to it by Dr. Pemberton, in the valuable work to which we have just referred, and from which we shall select our description of the disease, which is by no means of very uncommon occurrence.

The attack of the chronic inflammation of the peritoneum is very different from that of the acute species. It advances by degrees, manifesting itself only by occasional superficial pricking pains over the abdomen, without producing any inclination to go to stool: the pulse is somewhat accelerated, and the tongue (particularly in the morning) is slightly covered with white fur. There is also considerable thirst; yet there is no exacerbation of fever in the evening, nor any hectic flushes on the cheeks: on the contrary, the countenance is full of languor, and the face is pale and doughy.

In the early stages of the disease, the patient is capable of performing his ordinary avocations, and only complains, after fatigue, of a certain degree of tightness and pricking soreness across the abdomen, from one *os ilium* to the other. This state will continue, with little variation, for many months, during which the operations of the bowels will sometimes proceed naturally, though more commonly the patient is costive. There is no tension of the skin of the abdomen, as in the acute species; on the contrary, the skin and abdominal muscles are sometimes observed to sit loosely upon the peritoneum, which gives a sensation to the touch, as of a tight bandage underneath, over which the skin and muscles may be said (as it were) to play. The patient always complains more of the *tightness* than of the *pain*; and as this tightness is much increased by any congestion in the intestines, the relief which he experiences from evacuating their contents, leads him to attribute his sensations to an habitual costiveness, for the removal of which supposed evil all his endeavours are usually directed.

In the mean time the disease gains ground, till it assumes, from some accidental circumstance, either the acute form above described, or till coagulable lymph is slowly thrown out from the inflamed surface, which, becoming in part organized, will glue together the convolutions of the intestines. In the former case the danger will be extreme, in consequence of the great debility to which the patient will have been reduced by the duration of the preceding disease; and in the latter case an equal danger will be incurred by the interruption of the peristaltic motion. Sometimes a resolution of the inflammation takes place from the effusion of a fluid, when dropsy in the belly is produced, which renders the situation of the patient still more hopeless.

The disease, indeed, is full of danger, as well from the slow insidious progress which it makes to undermine of itself the constitution, as from the accidents to which it exposes the patient during the long course of management required in its treatment. As another cause of danger, also, may be added, the want of resolution, which we have so often to regret in patients during the cure of a chronic disease, where the advantages of the plan, from its gradual operation, are not so obvious to the senses. The symptoms, which indicate recovery, are, an abatement of the pricking pains of the abdomen, and a diminution of the frequency of the pulse to eighty in a minute: but even under these appearances, however favourable, a relapse is always to be dreaded.

On dissection, all the convolutions of the intestines are sometimes found blended together into one mass, so that it is impossible to separate them from each other, or from the peritoneal coat of the parietes of the abdomen. Sometimes the mesenteric glands are also found enlarged, but without any appearance of suppuration or of scrofula, but apparently in consequence of the irritation of the inflamed membrane, by which they are surrounded.

The treatment of chronic peritonitis consists in forbidding animal food, or broths, and all fermented liquors; in enforcing the absolute necessity of rigidly adhering to a milk and vegetable diet; and, above all, in taking away blood once or twice in the week to the quantity of six ounces each time. This plan is to be pursued till all sensations of pricking pain, and all whiteness of the tongue, have disappeared. If the constitution should shew signs of considerable derangement, it would be preferable to take the blood from the arm: but if, on the contrary, the local disease has made but little disturbance in the system, then the blood may be taken by the application of six or eight leeches to the abdomen, or by cupping. The bowels are to be kept in an open state, so that one or two evacuations shall take place each day; for which purpose small doses of the sulphate of magnesia, or castor oil, may be given daily. See Pemberton, on Dis. of the Abdom. Viscera, chap. i.

PERITROCHIUM, in *Mechanics*, a wheel or circle, concentric with the bale of a cylinder, and moveable together with it, about an axis. The axis, with the wheel and levers fixed in it to move it, constitutes that mechanical power, called *AXIS in peritrochio*; which see. See also *MECHANICAL Powers*.

PERIVALE, in *Geography*, a town of Hindoostan, in Marawar; seven miles N. of Ramanadporum.

PERJURY, **PERJURIUM**, in *Law*, the crime of swearing wilfully, absolutely, and falsely, in a lawful oath, administered in some judicial proceeding, by one who has authority, in any matter relating to an issue, or cause in question; whether it be of the person's own accord, or by subornation of another.

The law takes no notice of any perjury but such as is committed in some court of justice, having power to admi-

nister an oath, or before some magistrate or proper officer, invested with a similar authority, in some proceedings relative to a civil suit or criminal prosecution; for it esteems all other oaths unnecessary at least, and therefore will not punish the breach of them. The perjury must also be corrupt, (that is, committed *malò animo*,) wilful, positive, and absolute; not upon surprise or the like: it must also be in some point material to the question in dispute; for if it be only in some trifling collateral circumstance, to which no regard is paid, it is no more penal than in voluntary extrajudicial oaths.

Subornation is the offence of procuring another to take such a false oath as constitutes perjury in the principal.

If a man calls another *perjured*, he may have an action upon the case. If he calls him *forsworn*, no action lies, because the forswearing may be extrajudicial.

At common law, the punishment of perjury, and subornation of perjury, was anciently death; afterwards banishment, or cutting out the tongue; then forfeiture of goods; and now it is fine and imprisonment; and the offender is ever afterwards incapable to be a witness. (3 Inst. 163.) By statute 5 Eliz. c. 9, persons committing wilful and corrupt perjury, in any cause depending concerning lands or goods, &c. in any of the courts of record, leet, ancient demesne court, hundred court, court baron, or court of stannary, shall forfeit 20*l.* and be imprisoned six months, and their oaths shall not be received in any court of record, so that they are disabled from being jurors or witnesses; and if the offenders have not goods or chattels to the value of 20*l.* they shall be set on the pillory in some market-place, and have both their ears nailed to it; and unlawful and corrupt procuring and suborning a witness to give false testimony in any court of record, &c. or corruptly procuring any witness to testify *in perpetuam rei memoriam*, incurs a forfeiture of 40*l.* And if the offender be not worth 40*l.* he shall suffer six months imprisonment, and stand on the pillory one whole hour in some open market near the place where the offence was committed; and he shall incur perpetual infamy. But the prosecution is usually carried on for the offence at common law; especially, as, to the penalties before inflicted, the statute 2 Geo. II. cap. 25. made perpetual by the 9 Geo. II. cap. 18, superadds a power for the court to order the offender to be sent to the house of correction for seven years, or to be transported for the same period; and makes it felony, without benefit of clergy, to return or escape within the time. Our ancient law inflicted the punishment of deliberate murder on wilful perjury, when it was the cause of the death of an innocent person; and by the laws of France it was universally capital.

But corporal and pecuniary punishments, exile and perpetual infamy, are more suited to the genius of the English laws; where the fact is openly discussed between witnesses on both sides, and the evidence for the crown may be contradicted and disproved by those of the prisoner. And with regard to the punishment of deliberate murder above-mentioned, as the mere attempt to destroy life by other means is not capital, there is no reason that an attempt by perjury should; much less that this crime should in *all* judicial cases be punished with death. For, as judge Blackstone observes, to multiply capital punishments lessens their effect, when applied to crimes of the deepest dye; and, detestable as perjury is, it is not by any means to be compared with some other offences, for which only death can be inflicted: and therefore it seems already (except perhaps in the instance of deliberate murder by perjury) very properly punished by our present law; which has adopted the opinion of Cicero (*de Leg. 2. g.*), derived from the law of the twelve tables, "*perjurii pœna diyina, exitium; humana, dedecus.*"

To convict a man of perjury, a probable evidence is not enough; but it must be a strong and clear evidence, and the witnesses must be more numerous than those on the side of the defendant, for otherwise it is only oath against oath. (10 Mod. 194. Str. 1230.) It seems that the court will not ordinarily at the prayer of the defendant grant a "certiorari" for the removal of an indictment of perjury; for such crime deserves all possible discountenance, and the "certiorari" might delay, if not wholly discourage, the prosecution. 2 Hawk. c. 17.

Quakers making solemn affirmation wilfully and corruptly shall suffer as in cases of perjury. 8 Geo. c. 6.

If perjury be committed in a spiritual cause, the spiritual judge hath authority to inflict canonical punishment, and prohibition will not go. But the judge cannot punish profalute animæ; and the party grieved by such perjury must recover his damages at the common law. In the statute of the 5 Eliz. c. 23, concerning the writ de excommunicato capiendo, perjury in the ecclesiastical court is specified as an offence, among others, for which a person may be excommunicated; and conviction of perjury, either in the temporal or ecclesiastical courts, is cause of deprivation of benefice.

PERIWINKLE, in *Botany*. See PERVINCA.

PERIWINKLE, in *Natural History*, the English name of a species of shells, being the turbo littoreus of Linnæus. It has five spires; the first ventricose; in younger subjects striated spirally; in the old, smooth and of a dusky colour. This abounds on moist rocks, far above low-water mark, and is eaten in great plenty by the poor. The Swedish peasants believe, that when these shells creep high up the rocks, they indicate a storm from the south.

PERIZONIUS, JAMES, in *Biography*, a learned critic, was born in 1651, at Dam, in the province of Groningen, where his father was master of a public school. His family name was Varbrek, which, according to the custom of the times, he changed to Perizonius, having a similar signification in Greek. He, in his youth, studied at Deventer, and afterwards at Utrecht under Grævius. The invasion of Lewis XIV. interrupted his academical studies in 1672, but he resumed them in 1674 at Leyden, where he attended the lectures of Theod. Rychius. His first public employment was that of rector of the Latin school at Delft. In 1681 he was appointed professor of history and eloquence at Franeker, and in 1693 he removed to the same professorship, with that of the Greek language, at Leyden. He died in his 64th year, in 1715. He was author of a great number of learned works, of which the following are the principal; "Animadversiones Historicæ," consisting of explanations of many passages in the Greek and Latin writers; "Dissertationes," in several volumes 4to., chiefly relative to Roman history; "Orationes;" "Origines Babylonicæ et Ægyptiacæ;" an edition of Ælian's *Various History*, with a Commentary. Perizonius had collected a numerous and well chosen library, and a cabinet of medals, which were sold after his death. He left to the university of Leyden several ancient manuscripts, and scarce editions of the classics. *Moreri*.

PERKELSKAREN, in *Geography*, a small island in the gulf of Finland. N. lat. 60° 15'. E. long. 27° 24'.

PERKERI, a town of Curdistan, on lake Van; 18 miles E. of Argish.

PERLEBERG, a town of Brandenburg, and capital of the Mark of Pregnitz, situated on the Stipenitz, and containing about 378 houses, occupied principally by tradesmen and farmers; 62 miles N.W. of Berlin. N. lat. 53° 8'. E. long. 11° 58'.

PERLICAN, NEW, a noted harbour on the E. coast of Newfoundland island, eight leagues W.S.W. of Old Perlican, and five leagues from Random head. It has a wide and safe entrance, and ships may ride in it, locked from all winds, in from 10 to 5 fathoms water.

PERLSTEIN, in *Mineralogy*. See PEARLSTONE.

PERM, in *Geography*, a town of Russia, and capital of a government, on the Kama; 808 miles E. of Petersburg. N. lat. 57° 40'. E. long. 56° 14'.

PERMACOIL, a town of Hindoostan, in the Carnatic; 17 miles N.N.W. of Pondicherry. N. lat. 12° 14'. E. long. 79° 55'.

PERMALOOR, a town of Hindoostan, in the Carnatic; 12 miles S.W. of Corjeveram.

PERMANENT *Air* and *Quantity*. See the substitutes.

PERMEABLE denotes a body considered as its pores are capable of letting somewhat pass through them. See PORE.

PERMELLY, in *Geography*, a town of Hindoostan, in the circar of Aurungabad; 30 miles N.W. of Nander.

PERMIANS, a branch of the Finns, called in the Icelandic Reports "Biarrians," and denominated by the Russians "Permiaki," situated in the governments of Perm and Viatka, and in the northern districts of the river Oby. In the middle ages the Scandinavians seem to have given the name of Biarmia to the whole country between the White sea and the Ural. The Permians on the Dwina were discovered in the ninth century by Othere of Halgoland, a province at the extremity of Norway, who afterwards entered into the service of Alfred the Great, and drew up an account of this voyage in the Anglo-Saxon language. The Icelandic reports abound with accounts of these people. According to these reports the Permians on the White sea, and the parts about the Dwina, were the most wealthy, most powerful, and most remarkable of all the northern Finns. Here the carved image of the god Yummala, who was the universal deity of the Finns, as Perune was of the Slavonians and Lettes, and Odin of the Germans, had its far-famed temple, the description of which borders on the marvellous. According to this description the temple was artfully constructed of costly wood, and so richly ornamented with gold and precious stones, that it threw a radiance round the whole circumjacent country. The image of the god wore a golden crown set with 12 precious stones, a necklace worth 300 marks in gold, and a dress which outweighed the lading of three of the richest ships that navigated the Grecian sea. The figure also bore on its knees a golden chalice of such capacity, that four men might quench their thirst from its contents, and this vessel was filled with the same valuable metal of which its mass consisted. The northern free-booters were tempted by the reports of the wealth of this country to make incursions into it, and to take away some spoil from this temple. Even several Norwegian kings made predatory excursions into Permian, and usually returned with rich booty. We find also that the Scandinavian mariners visited this country for the purposes of trade, &c. without any piratical views. It is a curious inquiry how these Permian Finns accumulated so much gold, and how their country became the mart of a great and lucrative commerce. In very remote ages the Permians were already famous for their trade with the Persians and Indians. These nations brought their commodities over the Caspian up the Volga, and the Kama, to Tscherdyn, a trading town of ancient date on the river Kolva; and the Permians transported these goods as well as their own products along the Petshora to the Frozen ocean, where they bartered them with the people of those parts against furs

furs for their oriental trade. The ruins of ancient towns bear witness to the flourishing condition and the civilization of this people. The Permians appear, by historical traces still subsisting, to have been the only race of the Finns, who were a polished and commercial people, and known to other nations, while their kindred tribes were in a state of barbarism. The reports likewise speak of kings and a sort of political constitution in Biarmeland. With the year 1217, the expeditions of the Norwegians to Permia cease; but probably at an earlier period in the 11th and 12th centuries, the republic of Novgorod made itself master of this country, leading thither Russian colonies to keep the people in subjection. About the year 1372 the Christian faith was propagated in Permia by bishop Stephen. The Novgorodians having renounced all claim to this country, the Permians for a considerable period maintained the liberty of choosing their rulers from their own body. In 1543 the czar Ivan gave them the first viceroy, to whom the chief of the inhabitants were to act in a subordinate capacity in the affairs of government, and who had his seat first at Kolmogor, and afterwards at Archangel. At present the whole of ancient Biarmia, the borders of which cannot now be accurately defined, is divided into several governments; and the descendants of the Permians, heretofore so famous, numerous, and powerful, are dwindled away into an insignificant remainder, who, amidst thorough Russians, have lost almost all their national characteristics, even to their very language. Tooke's Russia, vol. i.

PER MINIMA, in *Medicine*, denotes a perfect mixture of the smallest particles of several bodies, or ingredients.

PER MINIMA, in *Pharmacy*, denotes an intimate and perfect mixture of natural bodies: wherein their very *minima*, i. e. their atoms, or first component particles, are supposed to be accurately blended together.

If silver and lead be melted together, they will thus mingle *per minima*.

PERMISSION, PERMISSIO, in *Rhetoric*, a figure which differs in nothing from concession, except that the latter relates only to argument and pleading, but the former to action. *E. gr.* "Quoniam, omnibus rebus ereptis, solum mihi superest animus et corpus: hæc ipsa, quæ de multis relicta sunt, vobis et vestræ condono potestati. Vos me quæ pæcio vobis videtur, utamini, atque abutamini; licebit impune. In me quicquid libet statuite, &c."

PERMISSIVE WASTE. See WASTE.

PERMIT, a certificate granted by excise officers, and signed by them, expressing the quantity of liquor, the name of buyer and seller, and that the duty hath been paid, or that it hath been condemned as forfeited.

PERMITTIT—*quare non Permittit*. See QUARE.

PERMSKOE, in *Geography*, a government of Russia, including the province of Perm and Ekaterinburg; bounded on the N. by the government of Vologda and Tobolsk, on the E. by that of Tobolsk, on the S. by Uplimskoe, and on the W. by Viatsku, about 360 miles from N. to S., and from E. to W. 240—260. N. lat. 55° 15'—61° 15'. E. long. 52°—63°. The province of Perm extends from N. lat. 55° 30' to 61° 14', and from E. long. 52° to 58'.

PERMUTATION, the truck, or exchange, of one thing for another. See EXCHANGE.

PERMUTATION, in the *Canon Law*, a real and actual exchange of two benefices.

Permutation is a means of bringing benefices into commerce without simony.

The conditions required to a canonical permutation, are, 1. That there be benefices permuted on either side, though the revenues be unequal; and, in case of inequality, no com-

penfation is to be made in money, but only a pension is to be charged on the greater. 2. That each of the permuteds quit their benefices, and make a procuracy *ad resignandum*. 3. That the permutation be followed by a collation of the ordinary. 4. That the ordinary be informed of the cause of the permutation. 5. That those, to whom the presentation or election to the benefices belongs, give their consent; or, in case of their refusal, that the consent of the diocesan be had.

The chief rules of permutation are, that if one of the compermuteds cannot enjoy, he re-enters, with full right, into the benefice he has quitted; and that, if he die before he have accomplished the permutation, on his part, by the taking of possession, the compermuted, who has accomplished, retains both benefices, unless they fall into the regale.

PERMUTATIONS of quantities, in *Algebra*, the changes, alternations, or different combinations, of any number of quantities. See these several articles.

PERMUTATIONE Archidiaconatus, et ecclesie eidem annexa cum ecclesia et prebenda, is a writ issued to an ordinary, commanding him to admit a clerk to a benefice upon exchange made with another. *Reg. of Writs*.

PER MY & *per tout*—A joint-tenant is said to be seized of the land he holds jointly, *per my & per tout*, i. e. he is seized by every parcel, and by the whole, *totum tenet, et nihil tenet; seu totum conjunctim, et nihil separatim*. Braçt.

PERNABIACABA, or PARANABIACUBA, in *Geography*, a mountain of Brasil, near the city of St. Paul.

PERNALLA, a town of Hindoostan, in Guzerat; 38 miles S. of Surat. N. lat. 20° 35'. E. long. 72° 53'.

PERNAMBUCO. See FERNAMBUCO.

PERNANCY, from the French *prendre, to take*, in *Law*, the taking or receiving any thing.

Tithes, in pernancy, are tithes taken, or which may be taken in kind.

PERNES, in *Geography*, a town of France, in the department of Vaucluse, and chief place of a canton, in the district of Carpentras. The place contains 3621, and the canton 6358 inhabitants, on a territory of 100 kilometres, in six communes.

PERNETTI, JAMES, in *Biography*, historiographer of the city of Lyons, and a member of the academy of that place, was a native of Forez. He assumed the title of "Miles Ecclesie Lugdunensis;" he was a man of pleasant manners, and entirely void of pedantry. He died at Paris in 1777. His works are, 1. History of Cyrus, in three vols. 12mo.; 2. Counsels of Friendship; 3. Letters on Physiognomy, three vols.; 4. The Abuses of Education; 5. Picture of the City of Lyons. He had a relation who was librarian to the king of Prussia, and who wrote a dictionary of painting, sculpture, and engraving; and a dissertation on America against Pauw, in two vols. 8vo.

PERNETY, ANTONY JOSEPH, was born in 1716, at Roane, in Forez. He entered into the order of Benedictines, and devoted himself to study, and the composition of numerous works, in which he displayed a systematizing spirit with a singular mode of thinking. Some of the principal of these are the following; "Dictionnaire de Peinture, Sculpture, et Gravure," 1757; "Dictionnaire mytho-hermetique," 1758; "Discours sur la Physionomie;" "Journal Historique d'un Voyage faits eux îles Malouines, en 1763 et 1764," two vols. 8vo. 1769; this account of a voyage made by himself, contains many curious particulars; it was translated into English, and read with interest at the time of the dispute with Spain, relative to these islands, which are the same with the Falkland islands; "Dissertation sur l'Amérique

rique et les Américains:" in this work and in his "Examen des Recherches Philosophiques de Pauw sur les Américains," he controverts the opinions of Pauw. He was author of many other works, and communicated several memoirs to the academy of Berlin, of which he was a member, and in which capital he resided a long time. He at length returned to Valence, in the department of La Drôme, where he died about the close of the century.

PERNIA, in *Geography*, a town of Croatia; 16 miles S.E. of Carlstadt.

PERNICIOUS ISLANDS, a cluster of islands in the South Pacific ocean, about 15 miles in circuit, so called by Roggwein, on account of the wreck of one of his vessels on the coast of one of them in 1722. S. lat. 16°. W. long. 140° 45'.

PERNIO, from *πῆμα*, the heel, a chilblain, a kind of complaint frequently affecting the heel. See CHILBLAIN.

PERNO, in *Geography*, a town of Sweden, in the province of Nyland, at the mouth of a river which forms a bay on the N. coast of the gulf of Finland; 12 miles E. of Borgo. N. lat. 60° 26'. E. long. 16° 4'.

PERNOR of Profits, he who takes or receives the profits of any thing. From the French *preneur*, taker.

PERNOV, or PERNAV, in *Geography*, a town of Russia, in the government of Riga, on a river near the Baltic, fortified and defended by a castle. After several times changing masters, it was finally, with the rest of Livonia, annexed to Russia; 92 miles N. of Riga. N. lat. 58° 30'. E. long. 42° 16'.

PERNSTAIN, a town of Austria; 12 miles N.N.W. of St. Wolfgang.

PEROE, a town of Hindoostan, in Bahar; 45 miles S.W. of Patna.

PEROJOA, in *Botany*, Cavan. Ic. v. 4. 29. t. 349. f. 2, was so named by Louis Née, who gathered the plant at Port Jackson, New South Wales, in honour of Francis del Perojo, a Spanish apothecary, who had been his botanical companion in a journey over the hills of the north of Spain. Mr. R. Brown however reduces the *Perojoa* to his genus *LEUCOPOGON*; see that article, sect. 4.

PEROLA. See *MOMORDICA*.

PERONE, in *Anatomy*, (*περον*, Gr.) the fibula.

PERONEAL ARTERY, an artery of the leg, running near the fibula. See *ARTERY*.

PERONES, in *Roman Antiquity*, a kind of high shoes formed rudely of raw hides, and reaching up to the middle of the leg; though in the more ancient times of the commonwealth, the senators used them, yet in later ages they were only used by the ploughmen and labourers. Hence *Peronatus Arator*. Persius, Sat. 5. ver. 192. and Juvenal, Sat. 14. ver. 186.

PERONEUS, in *Anatomy*, a name given to three muscles which arise from the fibula.

The *peroneus longus*, (long péronier latéral, péronéo-tarsien) is a long muscle, situated on the outside of the leg, and extending from the upper end of the fibula to the posterior extremity of the first metatarsal bone; it is thick in its upper half; thin, narrow, and flattened in the lower. It arises from the upper third part of the outer surface of the fibula, from two aponeurotic septa, of which one separates it from the extensor digitorum longus communis, and the other from the soleus and the flexor longus pollicis pedis, and on the outside and upper part from the internal surface of the fascia of the leg. The upper extremity reaches as high as the outer part of the upper end of the fibula, and the back of the external tuberosity of the tibia. It is covered on the outside by the fascia of the leg. It descends

at first obliquely from before backwards, increasing a little in size; then it soon begins to decrease, and forms a tendon first visible on the external and anterior part. This tendon goes behind the external malleolus in a groove, common to it with that of the peroneus brevis, and is confined there by a fibrous sheath, lined with a synovial membrane. Below the malleolus it separates from the tendon of the peroneus brevis, and passes downwards and forwards in a groove of the os calcis, where it is again confined by a fibrous sheath. It then turns over the external side of the os cuboides, and runs obliquely inwards and forwards in the channel hollowed out on the under surface of that bone, to which it is confined by a very strong fibrous sheath. It terminates at last by an attachment to the under and external part of the posterior end of the first metatarsal bone. Where it rubs against the surface of the os cuboides, the tendon has a thick and hard knot of a cartilaginous consistence, and sometimes even bony.

It extends the ankle joint, either by drawing the heel backwards and upwards, or by carrying the leg backwards on the foot. If it acts in the former manner, when we are standing, the elevation of the foot is accompanied by that of the leg and of the rest of the body. It must draw the outer edge of the foot outwards, and thus point the great toe towards the ground. If it acts in company with the tibialis posticus, the foot will be extended in the straight direction.

The *peroneus brevis* (court péronier latéral, péronéo-sus-metatarsien) is an elongated and flattened muscle, placed at the outer part of the leg, and extending from the lower two-thirds of the fibula to the fifth metatarsal bone. Its origin commences from the beginning of the second third portion of the fibula from above, and it occupies the outer surface of the bone to the lower fourth part, below which it is connected to the bone only by cellular tissue. The front edge corresponds to the extensor communis digitorum longus and peroneus tertius, and the back to the flexor longus pollicis, to which muscles it is connected by aponeurotic septa. The upper end of the muscle is narrow and pointed, it increases in size as it descends, but diminishes again at the bottom of the leg, where it forms a tendon, passing behind the malleolus internus in the same groove with that of the former muscle. Having arrived at the bottom of the fibula, it turns forwards and a little downwards along the outer surface of the os calcis, and is inserted into the posterior extremity of the fifth metatarsal bone. Sometimes a small production is detached from it, to run along the metatarsal bone, and join the extensor tendon of the little toe.

The peroneus brevis is covered externally by the fascia of the leg. Its use is the same with that of the preceding muscle.

The *peroneus tertius* (nonus Vesalii, péronier antérieur, péronéo-sus-metatarsien) does not always exist. It lies on the anterior and inferior part of the leg, and extends from the lower third part of the fibula, to the posterior end of the fifth metatarsal bone. It is elongated, and flattened laterally. Its origin, which is confounded with that of the extensor digitorum longus, occupies the lower third part of the front of the fibula; the muscular fibres pass obliquely downwards and inwards, and end in a tendon, which goes under the transverse ligament at the ankle, in company with the tendons of the extensor digitorum longus. It then turns outwards, runs over the extensor brevis digitorum, and is expanded before its insertion into the posterior part of the fifth metatarsal bone. The outer surface of this muscle, which is inclined forwards, is covered by the fascia of the leg; the inner surface corresponds to the extensor longus pollicis.

pollicis. The outer edge is separated by a small aponeurosis from the peroneus brevis. It bends the ankle joint, either by moving the foot on the lower end of the leg, or by carrying the leg forwards on the foot. In bending the foot, it will raise the outer edge particularly; but, if it acts in conjunction with the tibialis anticus, the foot will be bent without any inclination to either side.

PERONNE, in *Geography*, a town of France, and principal place of a district, in the department of the Somme, surrounded by marshes and strongly fortified. It has been called "Pucelle," because, though often besieged, it has never been taken. It is a very ancient place, and the kings of the Merovingian race had a palace here. The place contains 3706, and the canton 14,215 inhabitants, on a territory of 162½ kilometres, in 22 communes. N. lat. 50° 22'. E. long. 3° 1'.

PEROQUETTE, in *Ornithology*, a name of a small species of the pittacus or parrot kind, with a long tail. See PSITTACUS.

There are several kinds of this bird. 1. The common, which is green, red, and yellowish, and was the first species of parrot brought into Europe, and well known among the ancients. 2. The perouette, which is green all over, without any variegation. 3. The pale, green, and red kind. 4. The red and green-crested kind. 5. The red kind, with wings variegated with black and green.

Beside these, Margrave has described seven other Brazilian kinds, called the *tuiaputjuba*, *tuitirisa*, *jendaya*, *tuiete*, *tuipara*, *anaca*, and *quijubatui*, and two others, to which no particular name has been given; one of the size of a swallow, all over green, with a black beak, and a very long tail; and the other of the size of a starling, of a deep green on the back, and paler green on the belly, and with a shorter tail. Ray.

PERORATION, PERORATIO, or *Conclusion*, in *Rhetoric*, the epilogue, or last part, of an oration; wherein, what the orator had insisted on through his whole discourse, is urged afresh, with greater vehemence and passion.

The peroration consists of two parts: 1. Recapitulation, wherein the substance of what was diffused throughout the whole speech, is collected briefly and cursorily, and summed up with new force and weight.

2. The moving of the passions; which is so peculiar to the peroration, that the masters of the art call this part *sedes affectuum*.

The passions, to be raised in the peroration, are various, according to the various kinds of orations; in a panegyric, love, admiration, emulation, joy, &c. In an invective, hatred, contempt, &c. In a deliberative, hope, confidence, or fear.

The qualities required in the peroration are, that it be vehement and passionate; and that it be short; because, as Cicero observes, tears soon dry up.

The peroration was Cicero's master-piece: here that great orator not only set his judges and auditors on fire, but even seemed to burn himself; especially when he was to raise pity and commiseration towards the accused; where, as he himself tells us, he frequently filled the forum with weeping and lamentation. He adds, that, where there were several orators to speak for the same person, the peroration was always reserved to him; and subjoins, that if he excelled herein, it was not owing to genius, but the grief himself shewed. This is abundantly evident in his Milonian peroration, where he says, "sed finis fit: neque enim præ lacrymis jam loqui possum, & hic se lacrymis defendi vetat:" and in that for Rabirius Posthumus: "Sed jam, quoniam, ut spero, fidem quam potui, tibi præstiti, Posthume, reddam etiam

lacrymas quas debeo—jam indicat tot hominum fletus, quam sis carus tuis, & me dolor debilitat, includitque vocem."

The peroration, or conclusion of an oration or discourse, must vary according to the strain of the preceding part. Sometimes the whole pathetic part is most properly introduced in the peroration. (See PATHETIC.) Sometimes, when the discourse has been entirely argumentative, it is fit to conclude with summing up the arguments, placing them in one view, and leaving the impression of them full and strong on the mind of the audience. For the great rule of a conclusion, and what nature obviously suggests, is to place that last in which we choose that the strength of our cause should rest. Sermons commonly conclude with inferences; when this is the case, they should rise naturally, and so much agree with the strain of sentiment throughout the discourse, as not to break the unity of the sermon. Dr. Blair observes, that, in all discourses, care should be taken to conclude at the proper time, so as to bring our discourse just to a point; neither ending abruptly and unexpectedly; nor disappointing the expectations of the hearers, when they are looking for a close; and hovering round and round the conclusion, until they become heartily tired of us. We should endeavour to go off with a good grace; not to end with a languishing and drawing sentence; but to close with dignity and spirit, that we may leave the minds of the hearers warm; and dismiss them with a favourable impression of the subject, and of the speaker. Blair's Lect. vol. ii.

PEROS BANKOS, in *Geography*, a range of small islands in the East Indian sea. S. lat. 5° 30'. E. long. 72° 10'.

PEROSINA, an island in the Adriatic, about 12 miles in circumference. N. lat. 45° 17'. E. long. 14° 22'.

PEROT, an island of Canada. See OTTAWAS.

PEROTA, a town of Mexico, in the province of Tlascalala; 45 miles E. of Puebla de los Angeles.

PEROTIS, in *Botany*, so named by the late Dr. Solander, from *προς*, *deficient*, because the calyx was supposed to be wanting. *Art. Hort. Kew. ed. 1. v. 1. 85. v. 3. 506. ed. 2. v. 1. 136. Brown Prodr. Nov. Holl. v. 1. 172. Schreb. 786. Willd. Sp. Pl. v. 1. 324. Mart. Mill. Dict. v. 3.—Class and order, Triandria Digynia. Nat. Ord. Gramina.*

Gen. Ch. *Cal.* Glume of two equal, acute, awned valves, containing a single flower. *Cor.* of two minute, awnless, membranous valves, much shorter than the calyx: Nectary of two minute scales, at the base of the germen. *Stam.* Filaments three, capillary; anthers oblong. *Pist.* Germen superior, oblong; lyle capillary, deeply divided, shorter than the calyx; stigmas feathery, widely spreading. *Peric.* none, except the closed permanent calyx. *Seed* one, linear-oblong.

Ess. Ch. Calyx of two equal awned valves, single-flowered. Corolla of two minute awnless valves. Style deeply divided.

Obs. The characters of this genus of grasses were erroneously given by Dr. Solander, who mistook the calyx for a corolla. Willdenow copies this error, superadding another, that the "corolla is encompassed with woolliness," which last is, without any remark, adopted by Mr. Dryander in the second edition of Hort. Kew. The mistake arose from the quotation, in the first edition of *Saccharum spicatum*, Linn. Sp. Pl. 79, as a synonym to *Perotis latifolia*; for though Willdenow, even without seeing the plants, suspected a specific difference, it appears that he took his generic character from that *Saccharum*, which is no *Perotis* at all. Mr. Brown has not thought proper to point out these errors particularly, but he has, for the first time, given a correct definition of *Perotis*, which we have adopted.

1. *P. latifolia*. Broad-leaved Perotis. Ait. n. 1. Willd. n. 1, *α.* (*Anthoxanthum indicum*; Linn. Sp. Pl. ed. 1. 28. ed. 2. 40. A. n. 25; Linn. Zeyl. 10. *Gramen geniculatum brevifolium crispum, spicâ purpuro-sericeâ maderaspatanum*; Pluk. Phyt. t. 119. f. 1. *Alopecurus malabarica, foliis undulatis, spicâ prætenui*; Scheuchz. Agrost. 91. t. 2. f. 9, G. H. *Tsjeria-Kurenpullu*; Rheede Malab. v. 12. 117. t. 62.)—Stems ascending, much branched. Leaves ovate-lanceolate, wavy, with spinous teeth.—Native of the East Indies, from whence Dr. Solander is said to have procured it for Kew garden, in 1777. It is annual, flowering in the stove in August and September. *Root* of many long, whitish, wavy, downy fibres, apparently adapted to a sandy soil. *Stems* numerous, ascending, a foot high, much branched, copiously jointed, leafy, round, smooth. *Leaves* numerous, hardly an inch long, spreading, ovate, acute, rather pungent, glaucous, striated, smooth on both sides, rough at the edges with minute spinous teeth; sheaths close, ribbed, about the length of each leaf, except the upper ones, which are five times longer. *Spikes* solitary, terminal, purplish, three inches long, of very numerous flowers, which are imperfectly whorled, and stand on short stalks. *Calyx* minutely downy, strongly keeled, above half an inch long including the awns. Scheuchzer's excellent description, and correct figure, leave no doubt as to his synonym. That of Rheede, not having examined, we take upon Scheuchzer's authority chiefly, for every other writer who has touched upon this grass has made some mistake. Willdenow's variety *β* is the true *Saccharum spicatum* of Linn. Sp. Pl. ed. 1. 54, where Plukenet's t. 92. f. 5 is rightly cited for it, and Burmann has represented the genuine plant in Fl Ind. t. 9. f. 3. That grass seems to us really a *Saccharum*; or at least an *Imperata* of Brown. In Linn. Sp. Pl. ed. 2. 79, its synonyms are totally perverted, for every one there mentioned belongs to *Perotis latifolia*.

2. *P. rara*. Narrow-leaved Perotis. Br. n. 1.—“Stem erect, somewhat branched. Leaves linear, smooth; the lower ones flat; the upper involute.”—Gathered by Mr. Brown in the tropical part of New Holland. We have seen no specimen of this.

Willdenow's *P. polystachya*, which is *Saccharum panicum*, Lamarck Illustr. v. 1. 155. t. 40. f. 3, and perhaps *Andropogon crinitum*, Thunb. Jap. 40. t. 7, is judged by Mr. Brown to be a plant of a genus by itself, very nearly related to his *Imperata*, (*Saccharum cylindricum* of Lamarck, Willdenow, and Sm. Fl. Græc. Sibth. t. 54. *Lagurus cylindricus* of Linnæus,) but differing in having awns to the calyx, no inner valve to the hermaphrodite floret, and only one stamen, marks which perhaps are not sufficient in this case to found a genus upon. See SACCHARUM and LAGURUS.

PEROTTI, NICOLO, in *Biography*, one of the early Italian literati, was born in 1430. He was educated under Volpe at Bologna, and after finishing his studies, became himself a professor in that city, first of polite literature, and then of philosophy. He made himself known by various translations of Greek authors into the Latin language. As early as 1452, or 1453, he sent to pope Nicholas V. his version of the three first books of Polybius, to which he afterwards added two more, all that were then known of that author. He subsequently translated Epictetus's *Enchiridion*, the Commentary of Simplicius upon Aristotle's *Physics*, and Tatian's Oration to the Greeks. He was made poet laureat to the emperor Frederic III., and was employed in high official situations by several of the popes. He was particularly attached to cardinal Bessarion, whose conclavia he was after the death of Paul II. On this occa-

sion, it has been said that some cardinals coming to wait on Bessarion with the purpose of saluting him pope, were refused admission by Perotti, on the plea that he was engaged in his studies; and that after the election of cardinal Riario, Bessarion coolly said to him, “By your untimely care, you have lost me the tiara, and yourself a hat.” He was, however, appointed to honourable offices under the court of Rome, being made governor of Umbria in 1465; of Spoleto in 1471; and of Perugia in 1474. He died in 1480. His writings are numerous, but his most celebrated work was entitled “*Cornucopia*,” being a diffuse and learned Commentary on Martial's book on Spectacles, and the first book of his epigrams. It was not published till after his death; it contains a treasure of erudition respecting the Latin language. Moreri. Bayle.

PEROUR, in *Geography*, a town of Hindoostan, in the circar of Gooty; 24 miles S.S.W. of Anantpour.

PEROUSA, LA, a town of France, in the department of the Po, on the river Cluson; it gave name to one of the four valleys of Piedmont; six miles N. of Pinerolo.

PEROUSE, J. F. G. DE LA, in *Biography*, a celebrated but unfortunate navigator, was born at Toulouse in 1741. He entered into the French navy when he was only in his fifteenth year, in which he passed a life of almost constant service. By the firmness of his character, and his professional skill, he was regarded as fit for the most arduous enterprises. The triumphs of the French marine were few in his time; yet he commanded in the successful attempt to destroy the English settlement in Hudson's Bay in the year 1782. On the restoration of peace, it was resolved by the French ministry that a voyage of discovery should be undertaken to supply what had been left defective in the voyages of our illustrious navigator captain James Cook, and his associates. Lewis XVI, who may well be styled the *unfortunate*, drew up the plan of the intended expedition with great judgment and intelligence, and La Perouse was the person fixed upon to conduct it. With two frigates, la *Bouffole*, et l'*Astrolabe*, the first under his own command, the second under that of M. de Langle, but subject to his orders, they sailed from Brest in August 1785; touched at Madeira and Teneriffe, and in November anchored on the coast of Brazil. Thence they proceeded round Cape Horn into the South sea, and in February 1786 cast anchor in the bay of Conception, on the coast of Chili. At this time, so well had the means of preserving health been employed, that they had not a man sick. The ships reached Easter island in the month of April, and thence sailed, without touching at any land, to the Sandwich islands. On June 23d they anchored on the American coast, in lat. 58° 37', and landed on an island to explore the country and make observations. At this place, M. Perouse had the misfortune of having two boats wrecked, with the loss of all their crew. Thence he ran down to California, and in September anchored in the bay of Monterey, whence they took their departure across the Pacific ocean, and in January 1787 arrived in the Macao roads. In February they reached Manilla, which they quitted in April, shaping their course for the islands of Japan. Passing the coasts of Corea and Japan, they fell in with Chinese Tartary, in lat. 42½°, and ran to the northward. They anchored in a bay of the island of Sagalien, and thence proceeded up the shallow channel between that island and the continent as far as 51° 29'. Returning thence they reached the southern extremity of Sagalien in August, and passed a strait between it and Jesso, since named Perouse strait, into the North Pacific. On the 6th of September they anchored in the harbour of St. Peter and Paul in Kamt-

Kamtschatka. The ships having refitted they set sail, and arrived at the Navigators islands in December. In the bay of Maouna they met with a friendly reception from numerous natives, and began to take in refreshments. A party of sixty, under the command of M. de Langle, went ashore to procure fresh water, when a most unfortunate occurrence took place, in which they were attacked by the natives, and M. de Langle and eleven of his men lost their lives. Quitting this place without any attempts at vengeance, Perouse proceeded to New Holland, and arrived at Botany Bay in January 1788, and here terminates all that is known of the voyage of this navigator, from the journal which he transmitted to France. He had many and very important objects of research remaining, but was never more heard of. The vessels were probably wrecked, and all the crews perished, in that ocean which shall hereafter be called to give up its dead. Many efforts were made to obtain information of them, but they were fruitless. In 1798 was published, at the expence of the French nation, and for the benefit of the widow of Perouse, "Voyage autour du Monde par J. F. G. de la Perouse," in three vols. 4to. It was translated into the English. The discoveries of this navigator are chiefly in the seas between Japan and China, and China and Tartary.

PEROUSE, *Straits of La*. in *Geography*, a narrow channel of the North Pacific ocean, between the islands of Sagalien and Jesso; about 20 miles in breadth.

PERPENAGARDE, a town of Hindoostan; 20 miles S of Calicut.

PERPENDICULAR, in *Geometry*, a line falling directly on another line, so as to make equal angles on each side; called also a *normal* line.

Thus the line I G (*Plate XI. Geometry, fig. 4.*) is perpendicular to the line K H; *i. e.* makes right and equal angles with it.

From the very notion of a perpendicular, it follows, 1. That the perpendicularity is mutual; *i. e.* if a line, as I G, be perpendicular to another, K H; that other is also perpendicular to the first.

2. That only one perpendicular can be drawn from one point in the same plane.

3. That if a perpendicular be continued through the line to which it was drawn perpendicular; the continuation will also be perpendicular to the same.

4. That if there be two points of a right line, each of which is at an equal perpendicular distance from two points of another right line; that line is parallel to the other.

5. That two right lines perpendicular to one and the same line, are parallel to each other.

6. That a line, which is perpendicular to another, is also perpendicular to all the parallels of the other.

7. That perpendiculars to one of two parallel lines, terminated by those lines, are equal to each other.

8. That a perpendicular line is the shortest of all those which can be drawn from the same point to the same right line.

Hence the distance of a point from a line, is a right line drawn from the point perpendicular to the line or plane; and hence the altitude of a figure is a perpendicular let fall from the vertex to the base.

To erect a Perpendicular G I on any given point G, in a right line M L; one foot of the compasses being in G, with any interval at pleasure, cut off equal parts on each side G H and G K; from the points K and H, with an interval greater than the half of K H, strike two arcs intersecting in I; the right line G I is perpendicular to M L.

Perpendiculars are best described in practice by means of a square: one of whose legs is applied along that line, to or from which the perpendicular is to be let fall or raised.

To erect a Perpendicular on the end of a given line, suppose at P; open your compasses to any convenient distance, and, setting one foot in C, describe the arc R P S: lay a ruler from S through C, it will find the point R in the arc, whence draw P R, which is perpendicular to P S.

To let fall a Perpendicular on a given line M P, from a given point L (*fig. 5.*); set one foot of the compasses in L, and with the other cross the given line in the points M and G. Then setting the compasses in G and M, strike two arcs intersecting each other in a: then lay a ruler from L to a, and the line K L, described thereby, is the perpendicular required.

A line is said to be perpendicular to a plane, when it is perpendicular to all right lines, that can be drawn in that plane, from the point on which it infits.

A plane is said to be perpendicular to another plane, when all right lines drawn in the one, perpendicular to the common section, are perpendicular to the other.

If a right line be perpendicular to two other right lines, intersecting each other at the common section, it will be perpendicular to the plane passing by those two lines.

Two right lines perpendicular to the same plane are parallel to each other.

If, of two parallel right lines, the one is perpendicular to any plane, the other shall also be perpendicular to the same plane.

If a right line be perpendicular to a plane, any plane passing by that line will be perpendicular to the same plane.

Planes, to which one and the same right line is perpendicular, are parallel to each other: hence all right lines perpendicular to one of two parallel planes, are also perpendicular to the other.

If two planes, cutting each other, be both perpendicular to a third plane, their common section will also be perpendicular to the same plane.

PERPENDICULAR to a curve, is a right line cutting the curve in the point in which any other right line touches it, and is also itself perpendicular to that tangent.

PERPENDICULAR, in *Fortification*. See *Military CONSTRUCTION*, according to M. Vauban's method, and according to count Pagan's method.

PERPENDICULAR, in *Gunnery*, is a small instrument used for finding the centre line of a piece in the operation of pointing it to a given object. See *Pointing of a GUN*.

PERPENDICULAR Roots. See *FIBROUS Roots*.

PERPENDICULARITY of Plants, in *Vegetable Physiology*, or the tendency which the stems of plants in general have to ascend, while their roots descend, is a curious phenomenon, first particularly noticed by M. Dodart, who laboured without much success to explain it; nor was M. de la Hire more happy in his theory on the subject. Dr. Darwin has, in our opinion, given the best explanation. He supposes that the root is most stimulated by moisture, the ascending part of the plant by air, and that each extends itself in the direction in which it meets with its requisite stimulus. This theory accounts, not only for the general direction of the stem and root, but for the occasional variations observable in both.

PERPENSUM, in *Botany*, a name applied by the younger Burmann to the *Gunnera* of Linnæus; whether adopted from Pliny, whose *Perpensa* is synonymous with *Bacchar*, or *Baccharis*; or whether in allusion to the consideration

fideration and trouble it cost him, in trying to understand the structure of the very singular flowers, we are uninformed. See GUNNERA.

PERPETUA, CAPE, in *Geography*, lies on the N.W. coast of North America. N. lat. $44^{\circ} 6'$. E. long. $235^{\circ} 52'$. This is the northern extreme of the projecting land; and the southern extreme was called by Cook cape Gregory, in N. lat. $43^{\circ} 30'$. E. long. $235^{\circ} 57'$.

PERPETUAL, something that endures always, or that lasts for ever.

PERPETUAL is sometimes also used for a thing that lasts, or holds, during a person's life.

Thus offices, &c. held *durante vita*, are sometimes called perpetual offices. In this sense, M. Fontenelle was said to be perpetual secretary of the Royal Academy of Sciences. Hence the French called him absolutely, *M. le Perpetuel*.

PERPETUAL *Action*. See ACTION.

PERPETUAL *Curate*. See CURATE.

PERPETUAL *Glands*, in *Anatomy*, are those which are natural; thus distinguished from the adventitious ones. See GLANDS.

PERPETUAL *Lamp*. See LAMP.

PERPETUAL *Motion*, in *Mechanics*. See MOTION.

PERPETUAL *Occultation* and *Apparition*, *Circle of*. See CIRCLE.

PERPETUAL *Pills*, *Pilule Perpetue*, among *Physicians*, are pills made of regulus of antimony; which, being swallowed and voided fifty times, will purge every time with undiminished force. See ANTIMONY.

PERPETUAL, or *Endless Screw*. See SCREW.

PERPETUAL *Virginity*. See VIRGIN.

PERPETUATING *the Testimony of Witnesses*. See PROVING a *Will in Chancery*.

PERPETUITY, in *Annuities*, denotes the number of years' purchase which is to be given for an annuity that is to last for ever, and it is always the quotient of unity divided by the interest of *l.* for a year, or *100l.* divided by the rate of interest. Thus, the perpetuity is 33.33 , 28.57 , 25 , 20 , or 16.666 , according as interest is reckoned at 3 , $3\frac{1}{2}$, 4 , 5 , or 6 per cent. See ANNUITIES and ASSURANCES.

PERPETUITY, *Perpetuitas*, in the *Canon Law*, the quality of a benefice that is irrevocable, or whose incumbent cannot be deprived, except in certain cases determined by law. It is asserted with reason, that the perpetuity of benefices is established by the ancient canons; and that priests are inseparably attached to their churches, as by a spiritual marriage. It is true, by the corruption of the times, the secular priests being fallen into great disorder, and even contempt, the bishops anciently called the religious to their assistance, and committed to them the cure of souls, and the administration of parishes; still remanding them back again to their cloisters, when they thought fit, and again revoking them *ad nutum*.

But this vague and uncertain administration only lasted to the twelfth century, when benefices returned to their essential perpetuity.

PERPETUITY of the *King*. See KING.

PERPIGNAN, in *Geography*, a city of France, principal place of a district, and capital of the department of the Eastern Pyrenées; and, before the revolution, the capital of Roussillon, and the see of a bishop; situated on the river Tet, about a league from the sea. The walls are of brick and stone, very high and thick, with several bastions; and its citadel is upon an eminence, commanding the town. It was founded in 1068 by Guinard, earl of Roussillon, and is said to have derived its name from that of an inn-keeper, viz. Bernard Perpignan. The eastern and western divisions

contain, each of them, 5550 inhabitants: the canton of the former has 9440, on a territory of 85 kilometres, in 14 communes; and that of the latter 8824, on a territory of $202\frac{1}{2}$ kilometres, in 6 communes. It has been often contested by the French and Spaniards. N. lat. $42^{\circ} 41'$. E. long. $2^{\circ} 59'$.

PERPURA, a river of Brazil, which runs into the Atlantic, S. lat. $3^{\circ} 50'$. W. long. $38^{\circ} 16'$.

PER QUÆ SERVITIA, in *Law*, is a writ judicial, issuing on the note of a fine; and lies for the cognizee of a manor, feignory, chief rent, or other services, to compel the tenant of the land, at the time of the fine levied, to attend to him.

PERQUAIM, or PELHAM, in *Geography*, a small island on the south coast of England, in Pool harbour.

PERQUIMINS, a river of North Carolina, which runs into the Atlantic, N. lat. $36^{\circ} 5'$. W. long. $76^{\circ} 32'$.

PERQUIMINS, a county of Edenton district, in North Carolina, bounded west by Chowan county, and east by Pasquotank, from which last it is separated by the river Pasquotank, a water of Albemarle sound. It contains 5609 inhabitants, of whom 1980 are slaves.

PERQUISITE, PERQUISITUM, any thing gotten by a man's own industry, or purchased with his own money; in contradistinction to that which descends to him from his father or his ancestors.

PERQUISITES of *Courts*, are those profits which arise to a lord of a manor, by virtue of his court-haron, over and above the certain yearly profits of his lands; as fines of copyholds, heriots, amerciaments, waives, strays, &c.

PER QUOD *consortium amisit*, or *Per Quod servitium amisit*, are words necessary in declarations for trespass, &c. where a man's wife or servant is beaten or taken from him, and he loses their services, &c. 2 Lil. Abr. 595, 596.

PERRAHGUNGE, in *Geography*, a town of Bengal; 87 miles N. of Dinagepour.

PERRANGUNGE, a town of Bengal; 66 miles N. of Dacca.

PERRAULT, CLAUDE, in *Biography*, an eminent architect, was born at Paris in 1613. He was brought up to the medical profession, and took his degree as doctor of the faculty of Paris in 1641. He practised little, however, excepting among his friends and the poor; and having a decided taste for drawing, and the fine arts, he turned his attention to the science of architecture, in which he became greatly distinguished. When the Academy of Sciences was founded, under the patronage of Colbert, in the year 1666, Perrault, who was one of the first members, was appointed to select a spot for an observatory; and he also gave a plan of the building, which was to be executed. When it was resolved, under Lewis XIV., to proceed in completing the palace of the Louvre, all the eminent architects were invited to give in designs of the façade; and that of Perrault was preferred. This is accounted the master-piece of French architecture, and it would alone suffice to transmit his name with honour to posterity. It was in vain that persons, jealous of his reputation, endeavoured to make the public believe that the real designer was Le Veau: they entirely failed in their proof, and the glory of Perrault remained untarnished. When Colbert, after the king's first conquests, proposed to construct a grand triumphal arch to his honour, Perrault's design had the preference, and the edifice was commenced. It was, however, never finished. In its masonry, Perrault employed the practice of the ancients, of rubbing the surfaces of the stones together with grit and water, so as to make them cohere without mortar. Other works of this architect were the chapel at Sceaux, that of Notre Dame in the church of the Petits Pères in Paris, the

water-alley at Versailles, and most of the designs of the vases in the park of that palace. By the king's command, he undertook a translation of Vitruvius, with notes, published in 1673. All the designs for the plates of this work were drawn by himself, and have been esteemed as master-pieces of the kind. He afterwards published an abridgment of that author, for the use of students. He likewise facilitated the study of architecture by a work, entitled "Ordonnance des cinq Espèces de Colonnes, selon la Méthode des Anciens." In the preface to this work, he maintains that there is no natural foundation for the architectural proportions; but that they may be infinitely varied, according to taste and fancy; an opinion which gave much offence, though justified by the practice of the ancients themselves. A collection of the drawings of several machines, which he at different times invented, was published after his death, in 4to. This excellent artill holds a respectable place among writers in his original profession, and, besides various memoirs on this subject, communicated to the Academy of Sciences, he published "Memoires pour servir a l'Histoire naturelle des Animaux," in 2 vols. His other writings of this class are contained in his "Essais de Physique," 4 vols. One of these volumes relates entirely to the organ of hearing, under the title of "Traite de Bruit." Another relates to the mechanism of animals, in which he anticipated Stahl in some of his opinions respecting the functions of the animal soul. In other parts of these essays he treats on the peristaltic motion, on the senses, on nutrition, &c. He died in Paris in 1688, aged 75. He had three brothers, of whom the youngest, Charles, deserves a particular notice.

Perrault published a "Dissertation upon the Music of the Ancients," in 1680, which is chiefly employed in proving that counterpoint was unknown to antiquity. He has manifested himself to have been perfectly master of the subject; he had read all the ancient authors who have written expressly upon it; he had examined the passages which have been thought the most favourable to it, in some authors who have only mentioned it occasionally; and had considered the marvellous effects attributed to it in others. He reasons forcibly, and the facts he alleges in support of the side he has taken, are strong and well stated. This work was neither the cause nor consequence of the quarrel between Boileau and his brother, Charles Perrault, which did not break out till seven years after the publication of the "Essays in Natural Philosophy," in the second volume of which the "Dissertation upon the Music of the Ancients" first appeared. Our author had indeed given his opinion upon the subject very freely, in the notes to his excellent translation of Vitruvius in 1673; where, in his commentary of the chapter upon "Harmonic Music, according to the Doctrine of Aristoxenus," he declares that "there is nothing in Aristoxenus, who was the first that wrote upon concords and discords, nor in any of the Greek authors who wrote after him, that manifests the ancients to have had the least idea of the use of concords in music of many parts." *Les dix Liv. d'Architecture de Vitruve, liv. v. p. 161, 2d edit. 1684.*

PERRAULT, CHARLES, was born at Paris in 1633. He was placed at an early age in the college of Beauvais, where he soon attracted notice by his facility in making verses. A quarrel with the principal of the college obliged him to quit the college, and interrupted the ordinary course of his studies. He, however, by no means deserted literary pursuits, but associating himself with a friend of the same age, they read the best authors together, discussing their merits, as they went along; and this second education was, in his opinion, much more useful than the first. They also indulged in the burlesque, which was then much in vogue;

and they joined in a travestie of the sixth book of the *Æneid*. Perrault was brought up to the profession of the law, and was admitted an advocate. He was, however, taken from this career by the minister Colbert, who chose him secretary to a small society of men of letters, which assembled twice a week at his house. Their business was to plan devices for medals, and other memorials, at the king's requisition, and commemorative of the glories of his reign; and this was the foundation of the celebrated Academy of Inscriptions and Belles Lettres. Charles Perrault had a singular talent for inventions of this kind, and those which he proposed commonly obtained the preference. His influence with the minister was constantly employed in the service of science and literature. He procured for the French academy apartments in the Louvre; and his brother Claude shared in the establishment of the Academy of Sciences. When Colbert caused a sum to be set apart in the treasury, for pensioning, in the king's name, the most eminent men of letters, as well in foreign countries as in France, its distribution was principally confided to Perrault. For his great services in the cause of science and literature, the French academy manifested its gratitude, by admitting him a member in 1671; and his discourse at his reception gave so much satisfaction to that body, that it thenceforth became a custom to print the admission harangues. His connection with Colbert was interrupted by some mortifications to which the minister exposed him. Perrault retired, and refused to return when invited. He withdrew to a house in one of the suburbs of Paris, in the neighbourhood of the colleges, which he chose for the purpose of superintending the education of his two sons. Here he passed his time in literary leisure, and in the enjoyment of domestic happiness. He exercised himself in writing, and composed several poems: of these one was entitled "Le Siècle de Louis XIV." It laid the foundation of a controversy, which divided all the wits in France. In enumerating the glories of the reign, he had enhanced them by a depreciation of the ancients, in every point of comparison; and as this was regarded by the votaries of antiquity in the light of a profanation, he supported his opinion by an elaborate prose work, entitled "Parallele des Anciens, et des Moderns," 4 vols. 12mo. After Perrault had withdrawn himself personally from the controversy, he occupied himself in drawing up his "Eloge Historique d'une Partie des grands Hommes qui ont paru dans le xvii Siècle." Of this work he published two volumes, folio, in 1697, 1700, with the portraits of the subjects of his eulogy. This estimable writer, who invariably maintained the character of a man of worth, died in 1703, at the age of 70. Memoirs of Charles Perrault, written by himself, were published 60 years after his death, which have been highly valued for their frankness, and for the anecdotes which they contain. Moreri.

PERRE, in *Ancient Geography*, a town of Asia, in Comagene, situated at the confluence of two small rivers, which discharged themselves into the Euphrates, south of this town.

PERREL, in *Geography*, a small island in the gulf of Tonquin, near the coast. N. lat. 20° 59'. E. long. 106° 58'.

PERRENOT, ANTONY, in *Biography*, usually known by the name of cardinal Granvelle, a celebrated statesman, was the son of Nicholas Perrenot, lord of Granvelle, chancellor to the emperor Charles V. He was born in 1517 at Besançon, and, after studying in the universities of Louvain and Padua with great reputation, entered into holy orders. He was brought to court by his father, and was employed by Charles V. in various embassies, in which he acquitted himself so well, that he gained the confidence of his master.

He

He was made bishop of Arras at the age of 25, and upon the resignation of Charles, was recommended so strongly by that sovereign to his son Philip II., that he became his most confidential minister. From Arras he was translated to the archbishopric of Mechlin, and in 1561 was created cardinal by Pius IV. Granvelle was unquestionably a great man, and possessed very commanding talents; he is said to have occupied five secretaries at once, dictating to them in different languages, of which he thoroughly possessed seven. When Margaret of Austria was placed by Philip at the head of the government in the Low Countries, Granvelle was her principal counsellor, and in reality exercised the whole authority. He is represented by Grotius as a compound of industry, vigilance, luxury, and avarice; and as equally surpassing the common measure both in good and bad qualities. He was at all times anxious to extend the royal prerogative, and to crush the Protestants. His rule, at length, grew so odious to the nobles and people, that, in 1566, public complaints against him were transmitted to Philip, who thought it prudent to recall him, though he still had a great attachment to him. Having retired for some time to Benfauçon, of which city he was made archbishop, Philip again employed him in public affairs. He was sent to Rome at the election of Pius V., and was commissioned to negotiate a league against the Turks. After this, he resided some time at Naples, in quality of viceroy; and finally, he was nominated ambassador, to conclude the marriage of the infanta Catharine with the duke of Savoy. The fatigue attendant upon the journey threw him into an illness on his return, which carried him off at Madrid, in 1586, in the 70th year of his age. Moreri.

PERREUX, in *Geography*, a town of France, in the department of the Loire, and chief place of a canton, in the district of Roanne; 3 miles E. of Roanne. The place contains 2480, and the canton 6806 inhabitants, on a territory of 167½ kilometres, in 9 communes.

PERRHÆ, in *Ancient Geography*, one of the twelve principal towns of Etruria.

PERRHÆBI, a people who inhabited the eastern part of Thessaly, in the vicinity of the sea and of the mouth of the river Peneus, according to Strabo, lib. ix. In the wars between these people and the Lapithæ, Ixion and his son Pirithous took possession of their country: many of them retired into Epirus, and the rest withdrew into the interior of the country, near the river Peneus, and the environs of mount Olympus, and the river Titarese, where they were blended with the Lapithæ. Simonides calls them "Pelaf iotes." The migration of the Perrhæbi into Epirus took place about 30 years before the last war of Troy.

PERRITIO, in *Geography*, a river of Naples, which runs into the Crate, in the province of Calabria Citra.

PERRIWIG. See PERRUKE.

PERRON, in *Architecture*, a staircase lying open, or withoutside the building: properly, the steps before the front of the building, which lead into the first story when raised a little above the level of the ground.

Perrons are made of different forms and sizes, with regard to the space and height they are to lead to. Sometimes the steps are round, or oval; more usually they are square.

PERRON, JAMES DAVY DU, in *Biography*, a learned and celebrated cardinal, descended from two ancient and noble families of Lower Normandy, which, on account of their adherence to the Protestant faith, had sought an asylum in Switzerland, and settled in the canton of Berne, where the subject of this article was born in the year 1556. He was a youth of considerable talents, and taught himself the Greek language and philosophy. After this he applied

to the Hebrew, and soon became such a proficient in it, that he could read it with facility, and delivered a course, of lectures upon it before the Protestant ministers. In 1576 he was carried to the court of Henry III., which was then sitting at Blois, where the states were assembled, and was introduced to the king as a young man of extraordinary acquirements. Upon the breaking up of the states he went to Paris, where he mounted the rostrum in the great hall of the Augustines, in the habit of a cavalier, and held public conferences upon the sciences. About this time he changed his religious sentiments, and became reader to king Henry III., who appears to have been much attached to him. No sooner had he become a convert to the Catholic church, than he assiduously laboured for the conversion of others, and this even before he had embraced the ecclesiastical profession. When he entered into holy orders he was consecrated bishop of Evreux: this was in 1595, and in 1604 he was translated to the archbishopric of Sens. In the same year, in consequence of a letter written by the king to pope Clement VIII., that pontiff conferred on him the dignity of cardinal. After this he was employed by the pope in the most important councils and congregations. After the murder of Henry IV. he devoted himself entirely to the interests of the court of Rome, and by his subserviency to its policy, excited the indignation and hatred of the friends to the independence of the Gallican church. Towards the close of his life he passed his time chiefly in retirement, employing himself in putting his last hand to his works, which were printed in a press set up in his own house, that he might be satisfied of their correctness, by carefully revising every sheet before it was worked off. He died at Paris in the year 1618, in the sixty-third year of his age. He possessed a lively and penetrating genius, and a wonderful memory. He delivered his sentiments with ease and force, and wrote purely and eloquently. His works, which were printed separately in his life-time, were collected after his death, and published in three vols. folio, in the years 1622 and 1623. His secretary, Cæsar de Ligni, added to them a fourth volume, comprising his embassies and negotiations. Moreri.

PERRONET, JOHN RODOLPHUS, director of the bridges and roads of France, was born in 1708. He was brought up to the profession of architecture in the city of Paris, and made great progress in the art. In 1745 he became inspector of the school of engineers, of which he was afterwards a director. France is indebted to him for several of its finest bridges and best roads, the canal of Burgundy, and other great works. He was, for his public services, honoured with the order of St. Michael, and admitted a member of the Academy of Sciences at Paris; of the Royal Society of London; and of the Academy of Stockholm. He died at Paris in 1794. He wrote a description of the bridges which he had constructed, 2 vols. 12mo.; "Memoirs on the Method of constructing Grand Arches of Stone from 200 to 500 Feet in span."

PERROS GUERIC, in *Geography*, a town of France, in the department of the North Coasts, and chief place of a canton, in the district of Lannion; 4 miles N. of Lannion. The place contains 1477, and the canton 8440 inhabitants, on a territory of 157½ kilometres, in nine communes.

PERROT, Sir JOHN, in *Biography*, an eminent statesman, was born of an ancient family in Pembroke-shire about the year 1527. He was bred up in the house of the marquis of Winchester, that he might profit by the discourses and example of that great man. He was one of the knights of the Bath at the coronation of Edward VI., who had a great

great partiality for him. At the beginning of the reign of Mary he was sent to prison for harbouring Protestants, but, by the interference of friends, he was discharged. He assisted at the coronation of Elizabeth, who sent him, in 1572, to Ireland, as lord president of Munster, which was in a state of rebellion, but by his promptitude was quickly reduced to obedience. He was next appointed admiral of a fleet on the coast of Ireland, which was threatened to be invaded by the Spaniards. In 1583 he was made lord deputy of Ireland, where he carried things with so high a hand, as to give very great offence, and he was recalled in 1588, and sent to the Tower. In 1592 he was tried by a special commission, brought in guilty of high treason, and sentenced to die. He was, however, respited by favour of the queen, but died in confinement the same year. Biog. Brit.

PERROT D'ABLANCOURT, NICHOLAS, a distinguished French writer, was born, in 1606, at Chalons-sur-Marne. His father, who was a convert to Protestantism, sent him for education to the college at Sedan. He afterwards studied philosophy at home under a private tutor, and then went to Paris, where, at the age of 18, he was admitted an advocate. For a time he abjured the Protestant religion, but returned to it again. His acquisitions were very extraordinary: he was well versed both in the sciences and belles lettres, understood the ancient and several modern languages, and displayed quick parts and a penetrating judgment. He was keen in debate, but mild and easy in the commerce of life. He was admitted into the French academy in the year 1637. He began a translation of Tacitus, but before he had proceeded far in the undertaking he was obliged to go to his province to take care of his small property. Retiring with his sister to his estate of Ablancourt, he passed the rest of his life upon it, only occasionally spending the winter at Paris, for the purpose of printing his works. He was appointed, by Colbert, historiographer to the king, with a pension of 1000 crowns; but when his majesty was informed that he was a Protestant, the appointment was superseded. The pension was not formally taken away, but he probably received very little of it, as he is said to have died, very poor, in the year 1664. It is chiefly as a translator that d'Ablancourt has obtained a name among polite writers, and his industry in this office was remarkable. He published versions of Minutius Felix, four of Cicero's Orations, Tacitus, Lucian, Xenophon's Anabasis, Arrian's History of Alexander, Cæsar's Commentaries, Thucydides, &c. D'Ablancourt had studied Hebrew at Leyden, and the bible was one of the books on which he bestowed the closest attention. He relied wholly on revelation for his hopes of immortality, and on this subject he wrote a discourse to his friend Patru, which is published in the works of the latter. Moreri.

PERRUKE, or PERRIWIG, was anciently used for a long head of natural hair: such, particularly, as there was care taken in the adjusting and trimming of it.

Menage derives the word, by a long detour, from the Latin *pilus*, hair. The several stages of its passage, according to the critic, are, *pilus*, *pelus*, *pelutus*, *peluticus*, *pelutica*, *perutica*, *peruca*, *perruque*.

The Latins called it *coma*; whence part of Gaul took the denomination of *Gallia Comata*, from the long hair which the natives wore as a sign of freedom. An ancient author says, that Absalom's perruque weighed two hundred shekels.

PERRUKE is now used for a set of false or borrowed hair, curled, buckled, woven on strong thread, and sewed to-

gether on a frame, or cawl; and anciently called *capillamentum*, or false perruque. See HAIR.

It is doubted, whether or not the use of perruques was known among the ancients. It is true, they used false hair. Martial and Juvenal make merry with the women of their time, for making themselves look young with their borrowed hair: with the men who changed their colours according to the seasons; and with the dotards, who hoped to deceive the Destinies by their white hair.

But these seem to have scarcely had any thing in common with our perruques; and were, at best, only composed of hair painted, and glued together. Nothing can be more ridiculous than the description Lampridius gives of the emperor Commodus's perruque; it was powdered with scrapings of gold, and oiled (if we may use the expression) with glutinous perfumes for the powder to hang by. In effect, the use of perruques, at least in their present mode, is not more than two hundred years old: the year 1629 is reckoned the epocha of long perruques; at which time they began to appear in Paris; whence they spread, by degrees, throughout the rest of Europe. At first it was reputed a scandal for young people to wear them, because the loss of their hair at that age was attributed to a disease, the very name of which is a reproach: but at length the mode prevailed over the scruple, and persons of all ages and conditions have worn them; foregoing, without any necessity, the conveniencies of their natural hair.

However, it was some time before ecclesiastics came into the fashion: the first who assumed the perruque were some of the French clergy, in the year 1660; nor is the practice yet well authorized. The cardinal Grimaldi, in 1684, and the bishop of Lavour, in 1688, prohibited the use of the perruque to all priests, without a dispensation, or necessity. M. Thiers has a treatise exprest, to prove the perruque indecent in an ecclesiastic, and directly contrary to the decrees and canons of councils. A priest's head, embellished with an artificial hair curiously adjusted, he esteems a monster in the church; nor can he conceive any thing so scandalous as an abbot with a florid countenance, heightened with a well-curled perruque.

PERRY, JOHN, *Captain*, in *Biography*, an eminent English engineer, was recommended to the czar Peter during his abode in England, as a proper person to assist him in his favourite scheme of forming a navy, and promoting inland navigation within his dominions. He was taken into the czar's service with a liberal salary, and was employed three summers in making a communication between the rivers Don and Volga. The czar's ill success against the Swedes at the battle of Narva, and other circumstances of discouragement, caused an interruption of the work in 1707, and during the two following years he was engaged in refitting the ships at Voronetz, and making navigable the river of that name. He experienced many disappointments respecting the recompence of his labours, and was finally indebted to the protection of the English ambassador for the privilege of quitting the country in 1712. After his return, he published "The State of Russia," and in a few years afterwards he was employed in stopping the alarming breach of the embankment of the Thames at Dagenham, which he accomplished, and of which he published an account in 1721. He died in 1733.

PERRY, in *Rural Economy*, the name of a pleasant and wholesome liquor made from the juice of pears, by means of fermentation, somewhat in the same manner as cider is made from apples. See APPLE, CIDER, ORCHARD, PEAR, and PEAR-Tree.

The best pears for perry, or at least the sorts which have been hitherto deemed the fittest for making this liquor, are so excessively tart and harsh, that no one can think of eating them as fruit; for even hungry swine will not eat them; nay, hardly so much as smell to them. Of these the Bosbury pear, the Bareland pear, and the horse pear, are the most esteemed for perry in Worcestershire, and the squash pear, as it is called, in Gloucestershire; in both which counties, as well as in some of the adjacent parts, they are planted in the hedge rows and most common fields.

Mr. Knight states, that in the making of this sort of liquor, the pears are ground and pressed in exactly the same manner, as those of apples in the manufacturing of cider; but that it is not usual for the reduced pulp to be suffered to remain any length of time without being pressed. It has never been the practice in Herefordshire, or the counties in the vicinity of it, to blend the juices of the different varieties of the pear in order to correct the defects of one kind, by the opposite properties of the other. It is, however, he allows, more easy to find the required portion of sugar and of astringency as well as flavour, in three or four varieties than in one; hence, he supposes, a judicious mixture of fruits affords a prospect of great benefit.

In grinding, the pulp and rind of the pear, as in the apple, should be perfectly reduced, and though no benefit is said to have been derived from the reduced pulp remaining some hours unpressed, he has no doubt but that where all other circumstances are the same, that portion of liquor will for the most part be found the best, which has remained the longest under the power of the mill-stone.

The juices of the pear and the apple are constituted of the same component parts, but the proportions are different. In the juice of the pear the tanning principle is predominant, with a less portion of sugar, mucilage, and tinging matter.

And the method of managing this sort of liquor during the process of fermentation, is likewise nearly the same as that in cider; but that it does not afford the same indications by which the proper period of racking it off may be known. The thick scum that collects on the surface of cider rarely appears on the juice of the pear, and during the time of the suspension of its fermentation, the excessive brightness of the former liquor is seldom seen in the latter; but where the fruit has been regularly ripe, its produce will generally become moderately clear and quiet in a few days after it is made, and it should then be drawn off from its grosser lees. An excess of fermentation is prevented by the means used in the making of cider, and the liquor is rendered bright by isinglass. The power this substance possesses of fining liquors appears to be purely mechanical: it is composed of innumerable fibres, which being dispersed over the liquor, attach themselves to, and carry down, its impurities. For this purpose it should be reduced to small fragments by being pounded in a mortar, and afterwards steeped twelve or fourteen hours in a quantity of liquor sufficient to produce its greatest degree of expansion. In this state it must be mixed with a few gallons of the liquor, and stirred till it is diffused and suspended in it; and it is then to be poured into the cask, and incorporated with the whole by continued agitation for the space of two hours. This process must be repeated till the required degree of brightness is obtained, the liquor being each time drawn off, on the second or third day, from its precipitated lees. Not more than an ounce and a half, or two ounces of isinglass, are generally put into a cask of a hundred and ten gallons, at once; but

were its mode of action purely mechanical, there could be no objection to a larger quantity; but it has also a chemical action on the liquor. It combines with and carries down the tanning principle, and hence, during the process of fining, the liquor is deprived of a large portion of its astringency. This substance is most readily diffused in liquors by boiling; but by this it is dissolved, and converted into glue; and its organization, on which alone its powers of fining depend, is totally destroyed. The application of it is sometimes also necessary in the manufacture of cider; though colour is seldom wanting in that liquor.

But when perry or cider can be made sufficiently bright without it, the above cited writer would not by any means recommend its use. The liquor is rendered extremely agreeable to the eye by it; but has always appeared to him to become more thin and acid by its action.

In the after-management of perry the method is the same as that of cider; but it does not bear situations where it is exposed to much change of temperature so well, and its future merit cannot so well be judged of by its present state. In the bottle it almost always retains its good qualities, and in that situation he would always recommend it to be put, if it remains sound and perfect at the conclusion of the first succeeding summer. On the whole, the pear furnishes a less popular liquor than the apple, but the tree is capable of being grown on a greater variety of soil, and is more productive, furnishing in the proportion of 600 gallons of liquor to the acre, where the trees are full grown and in good bearing.

PERRYHAZAR, in *Geography*, a town of Persia, in the province of Ghilan, on the Caspian sea; 2 miles N. of Reshd.

PERSA, in *Ancient Geography*, a town of Asia, near the Euphrates, and in the vicinity of Samofata.

PERSA, in *Geography*, a town of Hindoostan, in Oude; 60 miles E. of Bahraitch.—Also, a town of European Turkey, in the province of Servia, on the Danube; 45 miles E. of Passarowitz.

PERSAC, a town of Persia, in the province of Irak; 25 miles S.S.E. of Sultania.

PERSAH, a town of Hindoostan, in the circar of Surooja; 10 miles N.N.E. of Surooja.—Also, a town of Mocaumpour; 36 miles S.S.W. of Mocaumpour.

PERSAIN, or BASSIEN, an old town of Pegu, situated on the western branch of the river Irrawady; 132 miles S.W. of Pegu. N. lat. 16° 45'. E. long. 94° 55'.—Also, a river of Pegu, which runs near the town of the same name, and discharges itself into the bay of Bengal, S.E. of cape Negrais.

PERSANTE, a river which rises in a small lake, about four miles N.W. from New Stettin, crosses Pomerania, and runs into the Baltic, a little below Colberg.

PERSAW, a town of Prussia, in Pomerelia; 7 miles N.W. of Marienburg.

PERSCHLING, a town of Austria, on a river of the same name, that runs into the Danube; three miles above Tullu. The town is eight miles S.W. of Tullu.

PERSCOVARI, a town of Walachia; 8 miles S.W. of Brancovani.

PER SE, in the *Schools*, is sometimes opposed to *per accidens*. In which sense, a thing is said to agree with another *per se*, when the agreement is not owing to any accidental event, but is found in the intrinsic principles of things themselves.

PER SE is sometimes also opposed to *per aliud*. In which sense, God alone is said to have a being *per se*, as not deriving

iving it from any other, but having it necessarily, and of himself.

PER SE, again, sometimes signifies as much as, of its own nature, or in virtue of its own entity. Thus the sun is said to give light *per se*; and thus quantity is extended *per se*.

PER SE, among *Logicians*. A thing is said to be known *per se*, or *per se notum*, when we immediately perceive it upon the first proposing of the terms. As, that the whole is greater than its parts.

Philosophers go so far as to consider the mode of a thing existing *per se*, or that which constitutes its existence such; which they call *perfectio*, *perfectitas*.

PER SE, *Object*. See OBJECT.

PER SE, in *Chemistry*. When a body is distilled singly, and without the usual addition of another matter to it, it is said to be distilled *per se*.

The genuine spirits of hartshorn are those raised *per se*, in opposition to those distilled with the addition of lime.

PERSEA, in *Botany*, an oriental fruit, mentioned by Pliny, book 15. chap. 13, and compared by him to the Red Myxa, or *Cordia* of Linnæus. The latter gives the specific name of *Persea* to a South American species of *Laurus*.

PERSECUTION, PERSECUTIO, literally imports any pain, affliction, or inconvenience, which a person designedly inflicts on another.

PERSECUTION more particularly denotes that tyranny which the sovereign power of any country exercises, or permits to be exercised, against those who adopt different opinions from its own in matters of religion. This kind of persecution is no less contrary to reason and sound policy, than to the forbearing, comprehensive spirit of Christianity, and the laws of humanity.

It is hardly necessary to observe, that the founder of Christianity never gave any directions to his disciples to propagate his religion by external force and violence. He was too well acquainted with the human heart to imagine that these were suitable means of making converts; and he well knew, what the experience of all ages has confirmed, that such methods disserve any cause in which they are employed, and that they are adapted only to make hypocrites or martyrs. Besides, persecution is altogether inconsistent with the distinguishing character of his religion, which is "peace on earth, and good will towards men." It is likewise altogether incredible, and even impossible, that the founder of a religion, who was himself crucified, and then raised from the dead and exalted to heaven, in confirmation of the truth of his doctrine, and as an example of fidelity to God, patience, resignation, and fortitude, and to raise the thoughts of his disciples and followers to things heavenly and divine:—it is impossible that such a teacher of religion should give any directions to his apostles and ministers to propagate his religion by force and violence.

What is religion but an exercise of the understanding and of the heart, the principles and affections of which are to regulate the conduct? Persecution, therefore, is altogether incompatible with its nature and design, and tends rather to obstruct than to promote its influence; to excite prejudices against it, than to gain proselytes to its interest. Should it be said that Christians have persecuted, and that "the weapons of their warfare," with a professed view of extending the spread, and maintaining the purity of religion, have been sometimes, and, indeed, in too many instances, "carnal," and not "spiritual;"—it is allowed and lamented. But to adopt the words of an excellent prelate of the last age, "let either the bitterest zealot, or the most bigotted infidel, shew, if they can, one instance in which the gospel gives the

Vol. XXVI.

least pretence for pious cruelty. Every where it breathes mildness, patience, forbearance; enjoins Christians of ever so different opinions, to receive one another in mutual charity, and even those who are no Christians it permits us not to judge hardly, much less to use them unmercifully. If, then, some who profess this faith will act in defiance to it, let them bear their condemnation: but to charge their guilt upon Christianity, would be like censuring the legal constitution of any government, because they who rebel against it behave unjustifiably. For indeed the spirit of persecution is rebellion against Christ, under a pretence of a commission from him; it is *the man of sin sitting as God in the temple of God*, 2 Thess. ii 3, 4. And where it is not designed impiety, it is the grossest ignorance both of the attributes of our Maker and the precepts of our Redeemer." We may observe farther, that all wise and understanding men, of every sect and religion, recommend moderation, and condemn force and compulsion in things of religion. This is true both of Christians and Gentiles, as Dr. Lardner in particular has shewn in a variety of instances, both of ancient and modern date. See HERESY.

PERSECUTION, as a term, is restrained to the sufferings of Christians, in behalf of their religion; particularly to those of the primitive Christians, under the heathen emperors Nero, &c. See MARTYR.

We usually reckon ten of these persecutions: Nero set on foot the first, A.D. 65; the second happened under Domitian, A.D. 90; the third began under Trajan, A.D. 100; the fourth under Adrian, A.D. 126; which was continued under Antoninus Pius, A.D. 140; the fifth under Marcus Aurelius, A.D. 162; the sixth under Severus, A.D. 203; the seventh under Maximinus, A.D. 236; the eighth under Decius, A.D. 251; the ninth under Valerian, A.D. 258; and the tenth under Dioclesian, A.D. 303.

It has long been a prevailing opinion, that Christians suffered ten persecutions under heathen emperors. But a learned and grave writer, deservedly much respected, has made some exceptions to this opinion. "If you speak," says Mosheim, "of heavy persecutions that prevailed every where, there were not so many; if of lesser troubles, there were more than ten. The number of ten general persecutions is no more than a popular error, which arose in the fifth century, destitute of good foundation in history, and founded on a fanciful interpretation of some texts of the Old Testament, where the Christian persecutions have been thought to be foretold. Lactantius, in his book "Of the Deaths of Persecutors," makes but six persecutions; Eusebius, in his "Ecclesiastical History," does not number the persecutions, though nine persecutions may be made out from it. Upon the whole, the notion of ten heathen persecutions had its rise in the fifth century." Mosheim de Reb. Christianor.

Mr. Gibbon, in the sixteenth chapter of the second volume of his "History of the Decline and Fall of the Roman Empire," seems disposed to mitigate the severities exercised against the Christians in the different parts of the Roman empire, and he says that the primitive Christians lamented, and perhaps magnified, their own sufferings. The ingenious parallels of the ten plagues of Egypt, and of the ten horns of the Apocalypse, says this author, after Orosius, Mosheim, and others, first suggested the calculation of ten persecutions to their minds: "and in their application of the faith of prophecy to the truth of history, they were careful to select those reigns which were indeed the most hostile to the Christian cause." After a reference to Mosheim (*ubi supra*) he adds that Sulpicius Severus was the first author of this computation; though he seemed desirous of reserving the tenth

PERSECUTION.

and greatest persecution for the coming of the antichrist. He also observes, that, "the indifference of some princes, and the indulgence of others, permitted the Christians to enjoy, though not perhaps a legal, yet an actual and public toleration of their religion." How far this was the case, will appear in the sequel of this article. The question with regard to the number of persecutions has been examined with judgment and candour by Dr. Lardner: and he has stated the result with his usual impartiality. From the book "Of the Deaths of Persecutors," erroneously ascribed to Lactantius (see his article), we can expect to derive no satisfaction on this head. It was the design of the author to speak of such persecutors only as came to an untimely end; and accordingly he writes concerning the persecutions of Nero, Domitian, Valerian, and Aurelian, who suffered a violent death; and he also mentions the misfortunes and calamities that befell Dioclesian, Maximian, Galerius and Maximin. But from this book no argument can be formed for determining the number of persecutions which Christians endured from heathen emperors. Eusebius, in his "Ecclesiastical History," has mentioned eleven persecutors, *viz.* Nero, Domitian, Trajan, Marcus Antoninus, Severus, Maximin the first, or the Thracian, Decius, Gallus, Valerian, Aurelian, Dioclesian, and his colleagues. But as the several persecutions of the heathen emperors did not terminate before the commencement of the fourth century, they could not be numbered till they all took place. Orosius, who compares the ten persecutions of the Christians with the ten plagues of Egypt, states their number to be ten, and expressly calls Dioclesian's the tenth and last. Augustine likewise reckons ten heathen persecutions, which he thus numbers: *viz.* the first, Nero's; the second, Domitian's; the third, Trajan's; the fourth, Marcus Antoninus's; the fifth, Severus's; the sixth, Maximin's; the seventh, Decius's; the eighth, Valerian's; the ninth, Aurelian's; the tenth, Dioclesian's. These two learned writers lived partly in the fourth and partly in the fifth century; and we may therefore conclude, that this mode of computing was in use before the end of the fourth century, and therefore did not originate, as some have said, in the fifth century. We have other positive testimony to the contrary. Jerom's book "Of Illustrious Men, or Ecclesiastical Writers," was published in the year 392, and he there sometimes numbers the persecutions. In one place he calls Domitian's the second persecution; in another he expressly mentions, though he does not number, Trajan's persecution; elsewhere, speaking of Polycarp, he says that he suffered in the time of the fourth persecution, under Marcus Antoninus: he expressly calls Decius's the seventh, and Cyprian's martyrdom he places in the eighth persecution, in the time of Valerian and Gallienus: and in his Latin edition of the Chronicle of Eusebius are ten persecutions, all expressly mentioned and numbered, as in Augustine's. Upon the whole we may say that, though some trifling affectation may have been manifested in numbering the persecutions, yet some have actually computed nine, others ten or eleven; but ten was a round number, and has generally prevailed.

It may be observed, that the primitive Christians called those troubles persecutions, which were ordered by edicts of emperors. Of such edicts or rescripts there were ten or eleven; and it is reasonable to suppose that all persecutions ordered by imperial edicts were general: they were intended for the whole Roman empire subject to their government, but possibly they did not all actually reach to every part of the empire.

It has been said, however, that all these ten persecutions will not prove, that Christians were all along in a state of persecution till the conversion of Constantine. The lives of

some of the persecuting emperors were short, and when they were dead, their edicts were little regarded, and then peace was restored to the churches. Dr. Lardner allows that there is some truth in this allegation; nevertheless he shews, by an appeal to historical facts and records, that Christians might be said, in a mild and qualified sense, to be in a state of persecution during this period.

Some writers have taken pleasure in contrasting the persecuting temper of the Christians with the mild toleration of the ancient heathens; and in extolling the humanity of the Roman magistrates, devising apologies for their conduct in doubtful or censurable instances, and exposing the enthusiasm of those deluded Christians, who were solicitous for obtaining the crown of martyrdom. Mr. de Voltaire was one of the number to which we now refer; and we should be glad if we could altogether exempt an historian, whose works we have read with pleasure and improvement, from the same charge. Mr. Gibbon says, "it is not improbable that some of those persons who were raised to the dignities of the empire might have imbibed the prejudices of the populace, and that the cruel disposition of others might occasionally be stimulated by motives of avarice or of personal resentment. But it is certain, and we may appeal to the grateful confessions of the first Christians, that the greatest part of those magistrates, who exercised in the provinces the authority of the emperor, and of the senate, and to whose hands alone the jurisdiction of life and death was intrusted, behaved like men of polished manners and liberal education, who respected the rules of justice, and who were conversant with the precepts of philosophy. They frequently declined the odious talk of persecution, dismissed the charge with contempt, or suggested to the accused Christian some legal evasion by which he might elude the severity of the laws. Whenever they were invested with a discretionary power, they used it less for the oppression, than for the relief and benefit of the afflicted church. They were far from condemning all the Christians who were accused before their tribunal, and very far from punishing with death all those who were convicted of an obstinate adherence to the new superstition." In other places our author seems disposed to vindicate the conduct of persecuting emperors, and on some occasions the historian assumes the character of an apologist. On the other hand, the conduct of the suffering Christians is so stated, as if their persecutors had conferred an obligation upon them, by condemning them to prison, torture, and death. See MARTYR.

The learned bishop of Landaff, in his excellent "Apology for Christianity," expresses a wish for the credit of human nature, that he could find reason to agree with the classical historian, to whom we have now referred, in what he has said of the "universal toleration of polytheism; of the mild indifference of antiquity; of the Roman princes beholding, without concern, a thousand forms of religion subsisting in peace under their gentle sway." But Dr. Watson is induced, by some passages in the Roman history, to hesitate at least in this point, and almost to believe, that the Romans were exceedingly jealous of all foreign religions, whether they were accompanied with immoral manners or not. The Romans, indeed, were accustomed to invite the tutelary gods of the nations which they intended to subdue, to abandon their charge, and to promise them the same, and even a more august worship in the city of Rome; and their triumphs were graced as much in the exhibition of their captive gods, as with the less humane one of their captive kings. But this custom, though it filled the city with hundreds of gods of various descriptions, cannot be alleged as a proof of Roman toleration: it may indicate the

excess of their vanity, the extent of their superstition, or the refinement of their policy; but it can never shew that the religion of individuals, when it differed from public wisdom, was either connived at as a matter of indifference, or tolerated as an unalienable right of human nature." We learn from Livy, the Roman historian, that the ruling powers at Rome were careful in preventing any sacrifices from being offered after a new or foreign manner; and that the ædiles had it in particular charge, that no gods should be worshipped except the Roman gods, and that the worship of these should only be conducted after the established manner of the country. Dion Cassius informs us, that Mæcenas recommends it to Cæsar, to worship the gods himself, according to the established form; and to force all others to do the same; and to *hate* and to *punish* all those who should attempt to introduce foreign religions. This system of Mæcenas contained no new doctrine; it was correspondent to the practice of the Roman senate, in the most illustrious times of the republic; and seems to have been generally adopted by the emperors, in their treatment of Christians, whilst they themselves were Pagans; and in their treatment of Pagans, after they themselves became Christians. In the investigation of the motives which induced the Roman emperors to persecute, and the Roman people to hate the Christians, our author conceives, that Mr. Gibbon was misled by the erroneous idea of the extreme tolerance of Pagan Rome.

PERSEES, or PARSEES, a name given to those ancient Persians and their descendants, who were worshippers of fire; for an account of whom we refer to the articles FIRE, *Everlasting*, GABRES, MAGI, MITHRA, ZEND, and ZOROASTER. See also PERSIA. These innocent idolaters have been almost extirpated in Persia by Mahometan fanaticism, that has propagated every scandal which malice could invent, representing them as devourers of children, and guilty of other atrocities. In Persia there are few or no remains of them, except perhaps a small number of visitors of the fiery eruptions of naphtha near Baku, on the western shores of the Caspian. (See *Everlasting* FIRE.) We learn from Mr. Hanway that they here worship the everlasting fire as an emblem of Ormuzd, or the supreme ineffable creator; while the evil principle believed to have sprung from matter was styled Ahriman. But the chief worshippers of the fire of Baku came from Hindoostan, to which the Persees retreated, on occasion of various persecutions which they suffered from the Mahometans, under the caliph Omar and his successors, and also by the shah Abbas. On occasion of the persecution under Omar, who compelled all his new subjects to abandon the religion of their forefathers, some of them fled to the most distant parts of the province of Caramania, or Kerman, in which, though belonging to Persia, the Mahometan sovereigns of the country suffered them to remain unmolested, with regard to their religion. Thevenot, who was in Persia in the year 1665, says, that they dwelt there, and also in other parts of Persia, exercising their religion without disturbance. Mr. Hanway says, that when he visited the country, there were some worshippers of fire at a place called Gueberabad, near Ispahan. The Persees who left their native country in consequence of persecution, settled in considerable numbers near Bombay and Surat, where they obtained permission of the Hindoos to take up their abode, and to exercise their religion without restraint; stipulating as a condition, that they should never kill an ox or a cow, which, it is said, they have uninterruptedly observed. Their number, in and round Surat, is estimated, according to Stavorinus, at about 100,000 persons, who almost all maintain themselves by agriculture and manufactures; and these, as Valentyn says, are the posterity of about 18,000 of their country-

men, who, flying from Omar, came by sea from Cape Jask, in the gulf of Persia, Gombroon, and Ormus, to Guzerat. Distinguished by their industry, they have among them no mendicants; and many of them are domestics in the service of the Europeans who arrive in the city. Their numbers daily increase, and they occupy many entire wards in the suburbs; and along the sea-coast from Baroche to Bazaim they have established several large and wealthy villages. Several of them, who reside at Surat, are rich, and may be reckoned among the principal merchants. In complexion, they are much fairer than either the Moors or Gentoos, and differ little from the Spaniards: they have, in general, large eyes, aquiline noses, and are well-proportioned. Their women are fair, tall, handsome, and lively. These people, it is said, are addicted to sensual pleasures of the grossest kind. By marrying wives of their own nation, their race has been preserved pure and unmixed to the present day. Adultery and fornication they punish among themselves, and even by death; giving cognizance of any capital punishment to the Moorish government: the execution is performed in secret, either by lapidation, drowning in the river, castigation, or beating to death, and sometimes by poison. Their females are marriageable before they are twelve years old; but though their marriages are contracted at an early age, yet it is not consummated till the above-mentioned age of puberty. It is not customary to give any portion with the bride; but every relation and friend of the bridegroom is obliged to present him with some articles of household furniture, money, or clothes, as soon as the intended nuptials are announced to them. When a Persian dies, the body is washed clean and dressed in the oldest clothes belonging to the deceased; it is then laid upon an iron bier, and carried out of the city to one of their receptacles of the dead, where it lies to be devoured by birds of prey.

The Persees live temperately; but, contrary to the custom of the Gentoos, they eat all kinds of flesh meat, except that of oxen and hares, that they may not give offence to that nation; but it must be killed and prepared by their own people. These Persees at Surat allege, that they possess a genuine copy of the institutes of Zoroaster: they likewise pretend, that the holy fire, which they brought with them at the time of the flight from Persia, has remained burning to the present day, without being extinguished, in their largest and principal temple, which stands near the Portuguese city of Daman. This holy fire is exposed to the vulgar only once a-year, on a festival in the month of October, which marks the commencement of their year: besides this festival, they have one every month, of a religious nature; in which they offer up devout supplications to their divinity. Every Persee likewise offers up a prayer every morning, turning towards the rising sun, and another every evening, presenting himself towards the moon, if she be visible. The element of water is also an object of reverence; and their reverence for fire is carried so far, that they will not extinguish it on any occasion, even by putting out a candle or lamp. When a fire takes place in the town, they do not endeavour to quench it with water, but pull down the houses and buildings liable to be consumed by the flames, that the fire may go out for want of combustibles to maintain it. These people have six or seven houses appropriated to their religion, which we may call churches, as well within as out of the town, in which a prayer, sermon, or exhortation is every day pronounced by their priests, and in which fire is kept constantly burning, and kept up by the most costly wood that can be procured. None but a Persee may enter one of these buildings. The Persees, it is said, never attempt to make profelytes. The Moors, Gentoos,

and Persees, notwithstanding the difference of their religions, exercise toward one another the greatest toleration and indulgence. They may be seen together in, or near the river, offering up their respective prayers, without mutual contempt or molestation. When the holy fire of the Persees is exhibited to the people, no Gentoo will either approach or touch fire, no more than the Persees themselves. This mutual forbearance exhibits an example worthy of imitation. Stavorinus's Voyages, vols. ii. & iii.

PERSEPOLIS, in *Ancient Geography*, a town of Persia, was formerly called "Elymas," now known only by its ruins and monuments, which have been described by many travellers, from Chardin to Niebuhr and Franklin. They are situated at the bottom of a mountain, fronting the S.W. about 40 miles to the N. of Shiraz. They command a view of the extensive plain of Merdasht, and the mountain of Rehumut encircles them, in the form of an amphitheatre. The nature of these ruins may be seen in the numerous plates that have been published; and without these plates, any description of the grand portals, halls, and columns, and numerous reliefs and devices, must be very unsatisfactory, and almost unintelligible. Here are many inscriptions in a character not yet explained; but which Niebuhr seems to have represented with great accuracy. The letters somewhat resemble nails, disposed in various directions, in which singularity they approach to what are called the Helsing runes of Scandinavia, but the form and disposition seem more complex, and perhaps a clue might arise from comparing the Uchen character of Thibet. Behind the ruin to the N. there is a curious apartment cut out in the rock, and a subterraneous passage, which seems to extend a considerable way. The front of the palace is 600 paces N. to S., and 390 E. to W.; and the mountain behind has been deeply smoothed to make way for the foundation. About three miles and a half to the N.E. of these rivers is the tomb of Rustan, the ancient Persian hero. Pinkerton's Geog.

The temple or palace at Persepolis, now called "the throne of Jemshid," is supposed to have been erected in the time of Jemshid, and to have been posterior to the reign of the Hindoo monarchs. The figures at Persepolis differ from those at Elephanta, which are manifestly Hindoo; and Sir William Jones conjectures, that they are Sabian, which conjecture is confirmed by a circumstance, which he believes to have been a fact, viz. that the "Takhti Jemshid" was erected after the time of Cayúmers, when the Brahmans had migrated from Irán, and when their intricate mythology had been superseded by the simpler adoration of the planets and of fire. Chardin, who observed the inscriptions on these ancient monuments on the spot, observes, that they bear no resemblance whatever to the letters used by the Gabres, in their copies of the Vendidad; whence Sir William Jones inferred that the Zend letters were a modern invention; and in an amicable debate with a friend, named "Bahman," that friend insisted that the letters, to which he had alluded, and which he had often seen, were monumental characters never used in books, and intended either to conceal some religious mysteries from the vulgar, or to display the art of the sculptor, like the embellished Cúfick and Nágári on several Arabian and Indian monuments. With regard to the unknown inscriptions in the palace of Jemshid, Sir W. Jones suggests, that it may be reasonably doubted, whether they contain a system of letters, which any nation ever adopted; in five of them the letters, which are separated by points, may be reduced to forty, or at least he could distinguish no more essentially different; and they all seem to be regular variations and compositions of a straight line and an angular figure like the head of a javelin or a leaf (to use the lan-

guage of botanists) "hearted and lanced." Many of the Runick letters appear to have been formed of similar elements; and it has been observed that the writing at Persepolis bears a strong resemblance to that which the Irish call "Ogham," (which see). The word "Agam" in Sanscrit means mysterious knowledge: but Sir William Jones dares not affirm, that the two words had a common origin; and he only means to suggest, that if the characters in question be really alphabetical, they were probably secret and sacerdotal, or a mere cypher, perhaps, of which the priests only had the key. In all the other inscriptions of the same sort, the characters are too complex, and the variations of them too numerous, to admit of an opinion, that they could be symbols of articulate sounds; for even the Nágári system, which has more distinct letters than any known alphabet, consists only of forty-nine simple characters, two of which are mere substitutions, and four of little use in Sanscrit or in any other language; while the more complicated figures, exhibited by Niebuhr, must be as numerous at least as the Chinese keys, which are the signs of *ideas* only, and some of which resemble the old Persian letters at Persepolis. The Danish traveller was convinced from his own observations, that they were written from the left hand, like all the characters used by Hindoo nations. Sir William Jones concludes with observing, that the square Chaldaic letters, a few of which are found in the Persian ruins, appear to have been originally the same with the Dévanágári, before the latter were enclosed, as they are now seen, in angular frames. Sir W. Jones's Sixth Discourse in vol. ii. of Asiatic Researches; or in his Works, vol. iii. 8vo. ed. See PERSIA.

Persepolis is now called *Istakhr*, or *Istakar*; which see.

PERSES, or PERSEUS, in *Biography*, the last king of Macedon, was the son of Philip V. by a concubine. He had a younger brother, Demetrius, who was the offspring of a legitimate marriage, and who on this and other accounts was regarded by Perseus with jealousy and dislike. Demetrius, having been given by his father as a hostage to the Romans, had received most of his education at Rome, and had acquired a predilection for that people. Perseus made a handle of this to deprive him of his father's affection, in which he too well succeeded: Demetrius was put under an arrest, under the pretence of a conspiracy, and was by the order of Philip poisoned. The king discovered the fraud that had been practised on him, and in a paroxysm of grief determined to exclude Perseus from the throne, and to appoint Antigonus in his stead, but death put an end to his projects. Perseus succeeded to the crown in the year 178 B.C. and his first act was to cause his competitor, Antigonus, to be put to death. He, however, attempted to extinguish the odium of this execution by a mild and prudent government. He ingratiated himself with his own subjects, by administering justice with impartiality, and he gained the good-will of the Grecian states by relinquishing certain claims made by his house upon their cities. To the Romans he sent an embassy of friendship, which they returned by the mission of ambassadors, who took upon themselves to controul him as a dependent, rather than treat him as a sovereign prince. Misunderstandings, therefore, soon arose between them; and in the prospect of a war Perseus cultivated the friendship of the Greek states, and the neighbouring princes. He also made ample provision of money and military stores, and kept on foot a numerous and well-disciplined army. With these laudable measures of policy he did not scruple to join base and treacherous attempts against his enemies. Eumenes, king of Pergamus, his great enemy, and who had made complaints against him before the Roman senate, having paid a visit to the temple at Delphi, was attacked by assassins on his

his return, and left for dead. This villainous deed was traced to Perfes, who was soon afterwards accused of a plot for poisoning the principal persons in Rome, who opposed the Macedonian interest. To the Roman ambassadors, who charged him with these crimes, he gave such an answer, that they left his kingdom, and every thing tended to immediate hostilities. Perfes still negotiated for peace, but was haughtily answered, that he might treat with the consul, who would shortly arrive in his kingdom with an army. When war was declared, he put himself at the head of a finer army than had been seen in Macedon since the expedition of Alexander the Great, and marched into Thessaly. He insulted in his camp the Roman consul, who was much inferior in force, and gained considerable advantage in a battle. Feeling, however, that he was not equal to cope with so formidable an enemy, he renewed his offers of peace upon very humiliating terms, which were not accepted. Perfes was obliged to retreat, and at Pydna he was under the necessity of putting his fate to the hazard of a general engagement, in which he was totally defeated. This took place in the year 168 B.C., and it is affirmed by Polybius and Livy, that during the battle Perfes was employed in sacrificing to Hercules in the city of Pydna; this has, it must be admitted, been contradicted by Posidonius, a Greek writer, who being present affirms, that Perfes, notwithstanding he had been disabled by a kick from a horse, insisted upon being conveyed into the field, where he encouraged his men during the combat, till a wound from a dart compelled him to withdraw. He fled, slenderly accompanied, to Pella, where, being remonstrated with by his two chamberlains, he stabbed them both with his own hand. Thence he retreated to Amphipolis, where having mounted the tribunal to address the people, his tears flowed so fast as to prevent his utterance. From Amphipolis he sailed to the isle of Samothrace, and took refuge in the temple of Castor and Pollux, which was regarded as an inviolable sanctuary. Doubting his safety there, he hired a mariner of Crete to carry him with his family and treasures to that island, but the man, having got the money on board, set sail, and left Perfes to regain admission into the temple. At length he surrendered himself to Octavius the Roman admiral, who conveyed him to the camp of Æmilius. The consul reproached him severely for his errors, but afterwards treated him with respect and kindness. He was, however, brought to Rome; thrown into prison, and reserved to decorate the triumph of the victor. To this disgraceful scene he came, clad in deep mourning, and followed by his two sons, his infant daughter, their attendants, and the principal Macedonian nobles. After this exhibition, he was thrown into a loathsome dungeon, and reduced to such wretchedness as to be obliged to beg a share of the small pittance allowed to his fellow prisoners. He died about two years after he had been led in triumph, but the manner of his death is not known, and in him ended the kingdom of Macedon, which had subsisted six hundred years from the time of Caranus the first king. His son Alexander was at first placed with a mechanic, a worker in wood, and is said to have become a very ingenious workman, after which he was promoted to be a clerk to the Roman senate. In these inferior occupations he probably enjoyed a greater share of happiness than he would have had in the superior rank of sovereign. Univer. Hist.

PERSEVERANCE, in *Theology*, a Christian virtue, by which, as some have maintained, we are enabled to persist in the way of salvation to the end: or, by means of which, all who have ever believed in Christ, so as to be in a state of salvation, are never suffered finally to perish, but either

continue in that state to the end of their lives, or if they fall from it are again recovered to it.

The final perseverance of the saints is an article much controverted between the Arminians and Calvinists, the latter of whom maintain it impossible for grace to be lost; and therefore make perseverance to the end, a necessary consequence thereof, which the former deny; esteeming the most confirmed believers never to be out of a possibility of falling.

Those who deny this doctrine allege against it the following arguments. 1. That there are various threatenings denounced against those who apostatize, both under the Old and under the New Testament; e. g. Ezek. iii. 20. xviii. 24. Heb. vi. 4—8. 29. Psalm, cxxv. 3, 4, 5. 2. That it is foretold as a future event, that some true Christians shall fall away. Matt. xxiv. 12, 13. John, xv. 6. Matt. xiii. 20, 21. 3. That many have in fact fallen away, as David and Solomon, and those mentioned 1 Tim. i. 19, 20. 2 Tim. iv. 10. Phil. iv. 3. Col. iv. 24. Philem. v. 24. 2 Pet. ii. 18. 4. That the doctrine of perseverance supercedes the use of means, and renders those exhortations and motives insignificant, which are so often to be found in scripture; e. g. Luke, xii. 5. Rom. xi. 10. 1 Cor. ix. 27. Heb. iii. 12. iv. 1. Rev. ii. 10. iii. 11. 2 Tim. ii. 12. 5. That the doctrine of final perseverance gives great encouragement to carnal security and presumptuous sin.

In favour of this doctrine it has been alleged, 1. That it is warranted by the promises of persevering grace. Jer. xxxii. 38—40. John, iv. 14. vi. 39. x. 28. xi. 26. 2. That it may be argued from the cheerful hope and persuasion which the apostles often express of their own perseverance, and that of their fellow-saints. Rom. viii. 35. 39. Phil. i. 6. 1 Pet. i. 4, 5. 1 Cor. i. 8, 9. 1 Thess. v. 23, 24. 3. Those passages are pleaded, in which this doctrine is said to be expressly asserted; Rom. viii. 28—30. Matt. xxiv. 24. 1 John, iii. 29. Matt. vii. 25. Compare Prov. iv. 18. Job, xvii. 9. Ps. xcii. 12—15. If. xl. 31. 4. There are many passages, in which it is asserted, that those who have fallen away from their profession were never sincere in it, which, it is said, plainly implies, that those who are sincere never fall away. 1 John, ii. 19, compared with Deut. xiii. 13. Matt. vii. 23. Luke, viii. 4—15. Those who wish to examine the arguments for and against this doctrine may consult Doddridge's Lectures, pt. viii. prop. 140, and the authors to whom he refers. The strongest argument, perhaps, in favour of the doctrine of perseverance, philosophically considered, is that which is deduced from the influence of habits: but to this argument it may probably be replied, that habits are not invincible.

PERSEUS, in *Astronomy*, a constellation of the northern hemisphere; whose stars, in Ptolemy's Catalogue, are 29; in Tycho's as many; in Hevelius's, 46; and in the Britanic Catalogue, 59. See **CONSTELLATION**.

PERSEUS, in *Mythology*, the son of Jupiter and Danaë. Danaë, according to the fable, was the daughter of Acrisius, who, having learned from the oracle, that at a future time his grandson would bereave him of his life and crown, shut her up in a tower of brass, and declined attention to every proposal of marriage for her. In the mean time Prætus, his brother, being desperately in love with his niece, by means of money, corrupted the fidelity of the keepers of the princess, and having gained access to her through the roof of the prison, made her the mother of Perfes. This fable has been comprised by Ovid (Met. l. 6.) in a single verse:

“Perfea quem pluvio Danaë conceperat auro.”

Those who have written the history of this adventure, wishing

ing to palliate the disgrace which this intrigue entailed upon the royal family, reported, that Jupiter, enamoured of Danaë, had transformed himself into a shower of gold; and this was the more probable, as Prætus, if we may believe Vossius (*De Orig. &c. Idol. l. i.*), assumed the surname of Jupiter. Pausanias (in *Corinth.*) mentions the tower, or rather apartment of brass, in which Danaë had been shut up, and assures us that it subsisted till the time of Perilaus, the tyrant of Argos, who demolished it; adding that even in his time some remains were still to be seen of the subterraneous palace, of which Danaë's chamber formed a part. Such is the story of Perseus's birth, which, considering all the circumstances attending it, is not improbable. When the princess was delivered of Perseus, Acrisius ordered her to be exposed upon the sea, with her child, in a mean barge, which, after long conflict with the winds and waves, stopped near the little island of Seriphus, one of the Cyclades in the Ægean sea. Polydectes, king of the island, hospitably received the mother and child, and took great care of the education of the young prince. But afterwards falling in love with Danaë, and fearing the resentment of Perseus, advancing to maturity, he sought a pretext for dismissing him. Under a pretence of wooing one of the Grecian princesses, he determined to make a magnificent feast for the celebration of the nuptials, and actually invited the princes of the neighbouring isles, each of whom was to bring with him a present of the best things which his country supplied. In order to prolong Perseus's expedition, he ordered him to fetch the head of Medusa, one of the Gorgons. Perseus, having rescued Andromeda from the monster that was ready to devour her, married her, and carried her to Seriphus, where, after he had put Polydectes to death, he went with her and his mother into Greece, and there slew Prætus, who, not content with his own inheritance, which was the city of Tyro, Mycæna, and the whole coast of Argolis, had dethroned Acrisius. Perseus re-established his grandfather in his dominions; but as he was endeavouring to shew his dexterity in playing at the quoit, he unfortunately slew him. Thus was accomplished the prediction delivered by the oracle before his birth. Perseus, having repaired to Argos, where he deeply regretted the paricide which he had thus accidentally committed, induced Megapentes, the son of Prætus, to exchange kingdoms with him, and he built Mycæna, which became the capital of his dominions. As our hero in his lifetime had been a patron of learning, and built an academy on mount Helicon; and as he was farther distinguished by his glorious exploits, he was advanced to heaven in the panegyrics made to his honour, and after his death became a demigod. Of this prince and all his wife's family, were also formed the constellations called Cassiopeia, Perseus, and Andromeda: and the very monster, which he was said to have killed, was placed in the heavens, where it formed the sign of the whale. They intermixed the recital of his actions with all the supernatural adventures they could devise; and it was fabled, that the gods had lent him their arms; Mercury, his wings and winged shoes, to denote the celerity of his voyages; Pluto, his helmet, a symbol of his prudence and policy, which made him conceal all his designs in deep secrecy; Pallas, his buckler, to signify the good fortune which always accompanied him.

Pausanias (in *Corinth. c. 18.*) says, this prince was worshipped as a hero at Argos, and still more in the isle of Seriphus and at Athens, where he had a temple, in which was an altar consecrated to Dictys and Clymene, who were reckoned his preservers. This Dictys was the brother of Polydectes; and he, together with his wife Clymene, had the care of his education by the king's order, when he was

driven by the waves into the island of Seriphus. If we may place any dependence on the history of the fabulous ages, Perseus lived about 100 or 120 years before the Trojan war. Accordingly, Perseus preceded Bellerophon several years, since the latter lived only 40 or 45 years at most before the destruction of Troy. Banier's *Mythology*, vol. iii.

PERSHORE, or PEARSHORE, in *Geography*, an ancient market town in the upper division of the hundred of Pershore, Worcestershire, is situated on the north side of the river Avon, 103 miles N.W. by W. from London. It consists of two parochial divisions; *viz.* the vicarage of St. Andrew, and the chapelry of Holy Cross. The road from London to Worcester passing through it, has occasioned a considerable increase in its size and population. Pershore is a town of great antiquity, and is said to have derived its name from the number of pear-trees which grew in its vicinity, and from its position on the shore, or bank of a river. According to bishop Tanner, Oswald, one of the nephews of Ethelred, king of Mercia, founded a monastery here in 689; but William of Malmesbury asserts that Egelward, duke of Dorset, in the reign of Edgar, was the first founder. Gough, in his additions to Camden's *Britannia*, accounts for the discrepancy, by stating that it was so considerably enlarged and increased in its endowments by Egelward, that he was considered a new founder. It consisted at first of secular clerks, then monks, who were dismissed by king Edgar in 984, from which time it became an abbey of Benedictine monks, dedicated at first to the blessed Virgin and the apostles Peter and Paul, but afterwards to St. Edburga. Belonging to the abbey was a large church, called the Holy Cross, 280 feet in length, and 120 broad. Of the abbey itself there are but few vestiges; but the church has been modernized, repaired, and used for parochial purposes. It has a lofty square tower, and contains several antique monuments. The church and convent, being originally built of wood, were several times destroyed by fire: on St. Urban's day, in the year 1223, and again in 1287, when an accidental conflagration reduced not only the abbey to ashes, but also consumed the greatest part of the town. In ancient times, the principal approach to the abbey was through Lice-street, a Saxon appellation derived from the corpses for interment being carried along that street. A small part of the gateway, on the north side, is still in existence; near it was the chapel of St. Edburga, the eighth daughter of king Edward the Elder, who reigned about the year 900. Pershore has two churches at present, that of Holy Cross, above-mentioned, and All Saints, which is small, but kept in neat order, and has a square tower. The parish is extensive, and contains several manors and chapelries. The town is principally situated in one street, about three-quarters of a mile in length, and has many respectable houses. Pershore formerly sent members to parliament, but none have been returned since the 23d year of Edward I. It has a market on Tuesday, and three annual fairs. By the census of 1811 the number of houses was 408, containing 1910 inhabitants, the greater part of whom are employed in the manufactory of stockings.

In the neighbourhood of the town are several villages of minor importance. Defford is a chapelry to Pershore, where are some salt springs; and near it is Coppin's court, which formerly had a magnificent edifice, now razed. At Wiston, near Wych, according to bishop Tanner, a priory of canons of the order of St. Augustine was founded by Peter de Corbizon, alias Studley, in the parish church of St. Peter, about the latter end of the reign of Henry I. It was afterwards removed to Studley, in Warwickshire; and, excepting the parish church, no traces of any ecclesiastical establishment remain. Wadborough, three miles N.W. of Pershore,

shire, was formerly called Abbot-wood, from the abbots of the monastery having had a park there. Near it is a considerable tract of woodland, called "Nash's plantation." Nash's History of Worcestershire, 2 vols. folio. Beauties of England, vol. xv.

PERSIA, or PERSIS, in *Ancient and Modern Geography*, a country of Asia, the limits of which have been various at different periods. Its ancient name was "Elam," or "Elymais," and its inhabitants were denominated "Elamites," as the descendants of Elam, the son of Shem, and under this appellation they formed, about the time of Abraham, in the 18th or 19th century B.C. a powerful state. The name of Persia is derived from the oriental term *Parsa*, and originating with the province "Pars" or "Fars," it at length comprehended the whole mighty empire. It has been also sometimes called Achemenia, from the name of Achenenes, one of its ancient kings; but more commonly by the natives, and also the more intelligent Mussulmans, "Iran," under which denomination were included all the wide regions to the S. and W. of the Oxus or Gihon; and the countries beyond that river subject to Persia were, in ancient times, denominated "Aniran." Persia extended, according to the geography of Ptolemy, between Media towards the N., and the Sinus Persicus or Persian gulf on the S.; it was separated from Babylonia by Susiana, and on the W. was Carmania. In settling the largest boundaries between which it lies, sir William Jones directs us to begin with the source of the Euphrates, and thence descend to its mouth in the Persian gulf, including in our line some considerable districts and towns on both sides the river; then coasting Persia, properly so named, and other Iranian provinces, we come to the delta of the Sindhu or Indus; whence ascending to the mountains of Cashgar, we discover its fountains, and those of the Iaihun, down which we are conducted to the Caspian, which formerly perhaps it entered, though it loses itself now in the sands and lakes of Khwárezm; we next are led from the sea of Khozar, by the banks of the Cur, or Cyrus, and along the Caucasian ridges, to the shore of the Euxine, and thence, by the several Grecian seas, to the point whence we took our departure, at no considerable distance from the Mediterranean. We cannot but include the lower Asia within this outline, because it was unquestionably a part of the Persian, if not of the old Assyrian, empire. Thus, says our author, we may look on Iran as the noblest island (for so the Greeks and the Arabs would have called it), or at least as the noblest peninsula on this habitable globe. The limits assigned by nature to Persia, and which naturally subsisted in the reign of Artaxerxes, the illustrious founder of the house of Sassan, are the sea of Oman or Persian gulf and Indian ocean to the S.; the Indus and Oxus to the E. and N.E.; the Caspian sea and mount Caucasus to the N.; and the rivers Tigris and Euphrates to the W.; which boundaries comprehend many extensive provinces and several kingdoms.

The extent of Persia, according to the statement of Mr. Pinkerton, is as follows. From the mountains and deserts, which, with the river Araba, constitute the eastern frontier towards Hindoostan, Persia extends more than 1200 miles in length, to the western mountains of Elwend, and other limits of Asiatic Turkey. From S. to N., from the deserts on the Indian sea, in all ages left to the Ichthyophagi, or wild tribes of Arabs who live on fish, to the other deserts near the sea of Aral, are about 1000 British miles. The dominion of the present king is restricted to the provinces of Fars and Irak, Lar, Chufistan, part of Curdistan, Adjerbijan, Ghilan, Mazanderan, the western parts of Khorasan, with the cities of Meshed, Nishapour, and Turshisá, and the

western division of Kerman, including the capital of that province.

It may seem strange that the ancient history of so distinguished an empire should be so imperfectly known; but this is principally owing to the superficial knowledge of the Greeks and Jews, and the loss of Persian archives and historical compositions. The first Persian emperor, with whose life or character the Grecian writers before Xenophon had any accurate acquaintance, was the great Cyrus, called by sir W. Jones "Caikhofrau." After various inquiries and diligent investigation the learned sir William concludes, that the Iranian monarchy must have been the oldest in the world; and he has taken considerable pains to ascertain to what race of kings, whether Hindoo, Arabian, or Tartar, or any other, those of Iran belonged. Our author was once of opinion, with other chronologers, that the first monarchy established in Iran was the Assyrian; that the Assyrian monarchs began to reign about 200 years after Solomon; and that, in all preceding ages, the government of Iran had been divided into several petty states and principalities. But upon farther research he changed his opinion, and concluded that a powerful monarchy had been established for ages in Iran before the accession of Cayúmers (said to be the great grandson of Noah) to the throne of Persia, in the 8th or 9th century B. C.; that it was called the Mahábáedian dynasty from Mahábád, supposed by the best informed Persians to be the first monarch of Iran and of the whole earth; and that many princes had raised their empire to the zenith of human glory. Mahábád, whose name is apparently Sanscrit, divided the people into four orders, *viz.* the religious, the military, the commercial, and the servile, to which he assigned names unquestionably the same in their origin with those now applied to the four primary classes of the Hindoos. Cayúmers was probably of a different race from the Mahábádians, and his accession seems to have been accompanied by a considerable revolution both in government and religion. The monarchy established in Iran long before the Assyrian government was, in our author's opinion, a Hindoo monarchy, or as some may probably chuse to call it, Cufian, Casdean, or Scythian; and he thinks, that it subsisted many centuries, and that its history has been ingrafted on that of the Hindoos. At the earliest dawn of history our author discovers the three distinct races of men, whom he has described as possessors of India, Arabia, and Tartary. Considering the central position of Iran, which is bounded by Arabia, by Tartary, and by India, whilst Arabia lies contiguous to Iran only, but is remote from Tartary, and divided even from the skirts of India by a considerable gulf; no country but Persia seems likely to have sent forth its colonies to all the kingdoms of Asia. The Brahmans could never have migrated from India to Iran, because they are expressly forbidden by their oldest existing laws to leave the region which they inhabit at this day: the Arabs have not even a tradition of an emigration into Persia before Mahomet, nor had they indeed any inducement to quit their beautiful and extensive dominions; and as to the Tartars we have no trace in history of their departure from their plains and forests, till the invasion of the Medes, who, according to etymologists, were the sons of Madai, and even they were conducted by princes of an Assyrian family. The three races already mentioned migrated from Iran, as from their common country: and thus the Saxon Chronicle, as sir W. Jones presumes, from good authority, brings the first inhabitants of Britain from Armenia, while, according to a very learned writer, who has made laborious researches, the Goths or Scythians came from Persia; and another writer contends with great force, that both the Irish and old Britons proceeded severally

PERSIA.

rally from the borders of the Caspian. We may, therefore, says sir William, hold this proposition firmly established, that Iran, or Persia in its largest sense, was the true centre of population, of knowledge, of languages, and of arts; which, instead of travelling westward only, as it has been fancifully supposed, or eastward, as might have been asserted with equal reason, were expanded in all directions to all the regions of the world, in which the Hindoo race had settled under various denominations.

Upon the whole there is reason to believe, that the original population of the mountainous country of Persia was indigenous, or at least no preceding nation can be traced; and in the opinion of the most learned and skilful inquirers from Scaliger and Lippius to sir W. Jones, this nation is Scythian or Gothic, and the very source and fountain of all the celebrated Scythian nations. While the northern Scythians of Iran gradually became a settled and civilized people, the barbarous northern tribes spread around the Caspian and Euxine seas; and besides the powerful settlements of the Getæ and Massagetæ, the Gog and Magog of oriental authors, and others on the N. and E. of the great ridge of mountains called Imaus, or Belur Tag, they detached victorious colonies into the greater part of Europe, many centuries before the Christian era.

The ancient Medes and Parthians, in the north of Persia, says Mr. Pinkerton, appear, however, to have been Sarmatic, or Slavonic origin, and to have spread from their native regions on the Volga towards the Caucasian mountains, along which ridge they passed to the S. of the Caspian, the ancient seats of Media and Parthenia. The grand chain of Caucasus forms a kind of central point of immigration and emigration from the E. and W., whence the great variety of nations and languages, that are traced even in modern times, proceeded.

In tracing the chief historical epochs of the Persian empire. Mr. Pinkerton, in his "Geography," first mentions the Scythians, as barbarous inhabitants of Persia, who, according to Justin's account, conquered a great part of Asia, and attacked Egypt about 1500 years before the reign of Ninus, the founder of the Assyrian monarchy. (See MONARCHY.) Ninus, with whom the history of the Assyrian monarchy commences, is said to have formed an alliance with the king of Arabia, and, in conjunction with him, to have subdued all Asia, except India and Bactriana; or, according to ancient knowledge, he subdued Asia Minor, and the west of Persia. Contemporary with him was Zoroaster, king of Bactriana, who is said to have invented magic. As Babylon, the capital of Assyrian power, was not far to the S. of Bagdad, it is likely that this power extended over great part of western Persia; and Nineveh, the foundation of which is ascribed to Ninus, was situated opposite to Mosul, about 300 British miles to the N. of Babylon. But the darkness and uncertainty of remote antiquity obscure this part of the history of Persia. When Cyrus founded the Persian empire, 559 years B. C., our knowledge of the state of Persia becomes more certain and satisfactory; and much less intermingled with fables than that which is derived from the native Persian histories, which carry us back to Kayumarras, (Cayúmers,) great grandson of Noah, and from ancient traditions referring to wars against Touran and India, which indicate the primitive eastern position of the people, and to the foundation of cities in the west, as Shiraz, Persepolis, &c. which could not have had their rise, considering the proximity of the Assyrian power, before Cyrus led the Persians from the N. and the E. to the S.W. The overthrow of the Persian empire, by Alexander, B. C. 331, (see MONARCHY), was followed by the Greek monarchs of Syria, and the

Grecian kingdom of Bactriana, which commenced about 248 years B. C., and contained several satrapies, among which was Sogdiana. The Persian empire was revived under the new name of the Parthian, which commenced about 248 years B. C. About the year 220 of the Christian era, Ardshur, or Artaxerxes, restored the Persian line of kings; and this dynasty was called Sassanides. The conquest of Persia by the Mahometans took place A. D. 636. The native kingdom was revived in Corasan or Khora'san, A. D. 820; and after several revolutions resumed its former situation. The accession of the house of Bouiah occurred A. D. 934; and that of the house of Sefi or Sofi, A. D. 1501, which was the origin of the title of Sofis of Persia. In this abstract we pass over the conquests of Zingis and Timur, together with the divisions and revolutions occasioned by them: and proceed to the reign of Shah Abbas, the great, A. D. 1586, (see ABBAS,) to the conquest of the Afghans in 1722, and to the consequent extinction of the house of Sofi, and to the elevation of Nadir, surnamed Thomas Kouli Khan A. D. 1736. (See KOULI KHAN.) The power of the successors of Nadir Shah was of short duration: and at length the government of western Persia was happily settled for a considerable space of time in the person of Kerim Khan, who died in 1779, as some say in the 30th year of his reign, or according to Dr. Pallas, in his 83d year, after an uncontested reign of only 16 years. He was acknowledged as sovereign of Persia by the Turkish emperor, and by the Hindoo sultan, Hyder Aly. His character was that of a mild and benevolent prince, and the people of Shiraz embalmed his memory with benedictions and tears of gratitude. After a scene of confusion and contest, Ali Murad, a kinsman of Kerim, took peaceable possession of the Persian throne: but in advancing against Agamamet, or Akau, who had, after the death of Kerim, assumed an independent sway in the Caspian province of Mazanderam, he fell from his horse, and instantly expired. At the close of Mr. Franklin's narration, Akau held possession of the province of Mazanderam, with the cities of Tebriz and Hamadan, and even that of Ispahan in the south, so that his sway might be said to extend over one-half of western Persia, while Iaafer, who had returned from an ineffectual expedition, to Shiraz in October 1787, possessed this city, or the province of Fars, with those of Beabun, and Shulter in the W., perhaps, says Pinkerton, the Kiab and Toftar of the maps, and he received tribute from Kerman and Lar or Laritan, and Abushehr or Basheer in the S., and the city of Yezd in the N. The wide province of Mekran is, probably, with Segitlan, tributary to the kings of Candahar. The armies of Iaafer and Akau did not each exceed 20,000 men; and they were considered as the sole candidates for the throne of western Persia. In 1792, as Dr. Pallas informs us, Akau collected an army and conquered the cities of Kasbin, and Tekheran or Tahiran; and being reinforced with the troops of Ali, khan of Hamfa, advanced against Iaafer, who retreating to Shiraz, was killed in an insurrection. Hidaet, khan of Ghilan, the only remaining rival of Akau, was forced to fly from Rasht, his place of residence, but was killed near the port of Simfil. By these events Akau became monarch of all western Persia; and being an eunuch, he nominated for his successor his nephew Baba Serdar.

Eastern Persia is separated in a great degree by high ridges of mountain and sandy deserts; and this separation has occasioned great obscurity in the ancient history of the country; as the eastern half remains distinct and independent, of the same general name with the western, but with limits and history totally different. The series of events after the Mahometan conquest; the kingdoms of Corasan, Samar-cand,

PERSIA.

cand, and Ghizni; and in recent times that of Candahar, may lead to safe conclusions concerning a similar division in remote periods. See CANDAHAR.

The provinces of Persia are Georgia; Erivan; Aderbijan, or Aiderbeitzan, including Mogan; Ghilan; Mazanderan, or Mazanderan, to the E. of which was the noted province of Hyrcania, now Corcam and Dahillan; Irac, or Irac-Agemi; Chofiltan, or Chufiltan; Pars, or Farfiltan; Kerman; Lariltan; Mekran, or Meeran; Segiltan; and Corafan, or Korafan; which see respectively. Besides these provinces, and exclusive of Asiatic Turkey on the W., the ancient Persian empire comprised Bactriana, or Balk, and on the other side of the Oxus, Sogdiana. See each in its proper place. Besides, the fifteenth satrapy of Herodotus comprised the Sacæ and Caspii, and some other tribes nearer the Caspian sea. The province of the Sacæ and Caspii adjoined on the W. to Corasma, which belonged to the sixteenth satrapy, and is now the desert space of Kharism, with the small territory of Khiva. Herodotus's account of the twenty satrapies, or great provinces of the Persian empire, in the reign of Darius Hystaspes, or Ghushtasp, has been well illustrated in a late work of major Rennell, to which we refer the reader.

The principal religion of Iran, if we rely on the authorities adduced by Moshani Fâni, a Mahometan traveller and native of Cashmere, who composed a tract on twelve different religions, entitled the "Dabistân," was that, which Newton calls the oldest, and it may be justly called the noblest, of all religions; viz. "a firm belief, that one Supreme God made the world by his power, and continually governed it by his providence; a pious fear, love, and adoration of him; a due reverence for parents and aged persons; a paternal affection for the whole human species, and a compassionate tenderness ever for the brute creation." So pure and sublime a system of devotion could not long remain among mortals unperverted; and we learn from the Dabistân, that the popular worship of the Iranians under Hushang, long anterior to that of Zeratusht (Zoroaster) was purely Sabian, a word which grammarians have deduced from "saba," a host, and particularly the host of heaven, or the celestial bodies, in the adoration of which the Sabian ritual is believed to have consisted. In the learned work just mentioned, we have a description of the several Persian temples dedicated to the sun and planets, of the images adored in them, and of the magnificent processions to them on prescribed festivals, one of which is probably represented by sculpture in the ruined city of Jeshmid at Persepolis; but the planetary worship in Persia seems to be only a part of a far more complicated religion, which we find in the Indian provinces. Mahábád, it is said, received from the creator, and promulgated among men, "a sacred book in a heavenly language," to which the Mussulman author gives the Arabic title of "defatir," or regulations, without ascertaining its original name; and they say, that fourteen Mahábáds had appeared or would appear in human shape for the government of this world. As we know, says sir W. Jones, that the Hindus believe in fourteen Menus, or celestial personages with similar functions, the first of whom left a book of "regulations" or "divine ordinances," which they held equal to the Vêda, and the language of which they believe to be that of the gods, we can hardly doubt, that the first corruption of the purest and oldest religion was the system of Indian theology, invented by the Brahmans, and prevalent in the territories, where the book of Máhabád, or Menu, is at this time the standard of all religious and moral duties. The accession of Cayúmers, already mentioned, produced a revolution both in government and religion; he was pro-

bably of a different race from the Mahábádians, who preceded him, and began perhaps the new system of national faith, which Hushang, whose name it bears, completed; but the reformation was partial; for while they rejected the complex polytheism of their predecessors, they retained the laws of Mahábád, with a superstitious veneration for the sun, the planets, and fire; thus resembling the Hindu sects, called "Saurás" and "Sagnicás," the second of which is very numerous at Benares, where many "agnihotrás" are continually blazing, and where the "Ságnicás," when they enter on their sacerdotal office, kindle, with two pieces of the hard wood "Semi," a fire, which they keep lighted through their lives for their nuptial ceremony, the performance of solemn sacrifices, the obsequies of departed ancestors, and their own funeral pile. This remarkable rite was continued by Zeratusht; who reformed the old religion by the addition of geni, or angels, presiding over months and days, of new ceremonies in the veneration shewn to fire, of a new work, which he pretended to have received from heaven, and, above all, by establishing the actual adoration of one Supreme Being. He was born, according to Moshan, in the district of Rai; and it was he, and not, as Ammianus asserts, his protector Gashtasb, who travelled into India, that he might receive information from the Brahmans in theology and ethics. Pythagoras might possibly have seen him in the capital of Irak; but the Grecian sage must have been then far advanced in years, and we have no certain evidence of an intercourse between the two philosophers. The reformed religion of Persia continued in force till that country was subdued by the Mussulmans; and without studying the Zend, we have ample information concerning it, in the modern Persian writings of several who professed it. Bahman, whom we have already mentioned, always named Zeratusht with reverence; but he was in truth a pure Theist, and strongly disclaimed any adoration of the fire or other elements; he denied, that the doctrine of two coeval principles, supremely good and supremely bad, formed any part of his faith; and he often repeated with emphasis, the verses of Ferdusi, on the prostration of Cyrus and his paternal grandfather before the blazing altar: "Think not, that they were adorers of fire; for that element was only an exalted object, on the lustre of which they fixed their eyes; they humbled themselves a week before God; and, if thy understanding be ever so little exerted, thou must acknowledge thy dependence on the being supremely pure." Sir William Jones closes this detail with avowing as firm a conviction, that the doctrines of the Zend were distinct from those of the Veda, as that the religion of the Brahmans, with whom (he says) we converse every day, prevailed in Persia before the accession of Cayúmers, whom the Parfis, from respect to his memory, consider as the first of men, although they believe in an universal deluge before his reign.

With the religion of the old Persians, their philosophy was intimately connected; for they were assiduous observers of the luminaries, which they adored, and established, according to Moshan, who confirms in some degree the fragments of Berofius, a number of artificial cycles with distinct names, which seem to indicate a knowledge of the period, in which the equinoxes revolve; they are said also to have known the most wonderful powers of nature, and thence to have acquired the fame of magicians and enchanters. Our author proceeds to make some remarks on that metaphysical theology, which has been professed immemorially by a numerous sect of Persians and Hindus, was carried in part into Greece, and prevails even now among the learned Mussulmans, who sometimes avow it without reserve. The modern philosophers of this persuasion are called "Sufis," either from the

Greek word for a *Sage*, or from the *woollen* mantle, which they used to wear in some provinces of Persia. Their fundamental tenets are, that nothing exists absolutely but God; that the human soul is an emanation from his essence; and though divided for a time from its heavenly source, will be finally reunited with it; that the highest possible happiness will arise from its reunion, and that the chief good of mankind, in this transitory world, consists in as perfect an union with the eternal spirit, as the incumbrance of a mortal frame will allow: with other particulars, for which we refer to sir William Jones's Sixth Discourse. See PERSEES and MAGI.

The religion of Persia at this time is the Mahometan, which, as it was introduced by the sword, has been followed by its usual effects, the destruction and depopulation of the country. Nevertheless the Persians are said to adopt a milder system of this creed, than that which is followed by the Turks and Arabs. As they reject several absurdities, they are regarded by the other Mahometans as heretics, and are denominated "Chias," or Schiites, while the pretended true believers assume the name of "Sunnis." Chardin has particularly described the Persian system of Mahometanism. The priests of this religion, or Mullas, are in Persia often styled "Akonds," signifying leaders; and they not only preach in the mosques, but are often schoolmasters. The Pachnamas are superior Mullas, or vicars of the Imams. The Fakirs or Calenders are wandering monks, or rather sturdy beggars; who, under the pretext of religion, compel the people to maintain them in idleness. See FAKIR.

The language of the first Persian empire was the mother of the Sanscrit, and consequently of the Zend and Parfi, as well as of Greek, Latin, and Gothic. When Anushiravan sat on the throne of Persia, two languages seem to have been generally prevalent in the great empire of Iran; that of the court, thence named "Deri," which was only a refined and elegant dialect of the "Parfi," so called from the province Pars or Fars, of which Shiraz is the capital, and that of the learned, in which most books were composed, and which had the name of "Pahlavi" or "Pehlavi," either from the heroes, who spoke it in former times, or from Pahlu, a tract of land, which is said to have included some considerable cities of Irak. The ruder dialects of both these languages were, and still are, spoken by the rustics in several provinces; and in many of them, as Hérat, Zábul, Sísán, and others, distinct idioms were vernacular, as it happens in every kingdom of great extent. Besides the Parfi and Pahlavi, a very ancient and abstruse tongue was known to the priests and philosophers, called "the language of the Zend," because a book on religious and moral duties, which they held sacred, and which bore that name, had been written in it; while the "Pázend," or comment on that work, was composed in Pahlavi, as a more popular idiom; but Bahman, a learned follower of Zerátusht, and Persian reader to sir W. Jones, assured him, that the letters of his prophet's book were properly called "Zend," and the language "Avesta," as the words of the Vedas are Sanscrit, and the characters "Nagari." The Zend, appropriating the name to the sacred language of Persia, and the old Pahlavi, are almost extinct in Iran; for among 6 or 7000 Gabres, who reside chiefly at Yezd, and in Kerman, there are very few who can read Pahlavi, and scarcely any who even boast of knowing the Zend; while the Parfi, which remains almost pure in the "Sháhnámah," has now become, by the intermixture of numberless Arabian words, and many imperceptible changes, a new language, exquisitely polished by a series of fine writers in prose and verse, and analogous to the different idioms gradually formed in Europe, after the subver-

sion of the Roman empire. Sir W. Jones assures us, that hundreds of Parfi nouns are pure Sanscrit, with no other change than such as may be observed in the numerous vernacular dialects of India; that very many Persian imperatives are the roots of Sanscrit verbs; and that even the moods and tenses of the Persian verb substantivè, which is the model of all the rest, are deducible from the Sanscrit by an easy and clear analogy. Hence he concludes, that the Parfi was derived, like the various Indian dialects, from the language of the Brahmans; and he adds, that in the pure Persian he finds no trace of any Arabian tongue, except what proceeded from the known intercourse between the Persians and Arabs, especially in the time of Bahram, who was educated in Arabia, and whose Arabic verses are still extant, together with his heroic line in Deri, which many suppose to be the first attempt at Persian versification in Arabian metre. But besides, "the composition of words," in which the genius of the Persian delights, and which that of the Arabic abhors, is a decisive proof that the Parfi sprung from an Indian, and not from an Arabian, stock. After full consideration, both sir William Jones and his reader Bahman were convinced, that the Zend bore a strong resemblance to Sanscrit, and the Pahlavi to Arabic. The Pahlavi our author conceives to be a dialect of the Chaldaic. By the nature of the Chaldæan tongue most words ended in the first long vowel, like "Shamià," heaven; and that very word, unaltered in a single letter, is found in the Pazend; together with a multitude of others, all Arabic or Hebrew with a Chaldæan termination. In Pahlavi the verbal terminations of the Persian are added to the Chaldaic root. All the words cited by the learned judge are integral parts of the language, not adventitious to it, like the Arabic nouns and verbs engrafted on modern Persian; and this distinction convinces him, that the dialect of the Gabres, which they pretend to be that of Zerátusht, is a late invention of their priests, or subsequent at least to the Mussulman invasion. Our author has further shewn, that the language of the *Zend* (which see) was at least a dialect of the Sanscrit, approaching perhaps as nearly to it as the Prácrit, or other popular idioms, which are known to have been spoken in India two thousand years ago. Upon the whole sir William Jones concludes, that the oldest discoverable languages of Persia were Chaldaic and Sanscrit; and that, when they had ceased to be vernacular, the Pahlavi and Zend were deduced from them respectively, and the Parfi, either from the Zend, or immediately from the dialect of the Brahmans; but all had perhaps a mixture of Tartarian; for all the best lexicographers assert, that numberless words in ancient Persian are taken from the language of the Cimærians, or the Tartars of Kipchak. See PERSIAN *Tongue*.

The more ancient monuments of Persian literature unhappily perished when the Mahomedan fanatics conquered the country in the 7th century. One of the oldest remains is the famous "Shahnamah," or history of kings, a long heroic poem of Ferdusi. Sadi, an excellent and entertaining moralist, writes in prose mingled with verse, like several of the Icelandic sages; and a translation of his works is very desirable. The Anacreon of the East is Hafiz, whose tomb is venerated in the vicinity of Shiraz, and a splendid copy of whose works is chained to his monument. But the arts and sciences in general are little cultivated by the Persians, who are said to be lost in abject superstition, and fond believers in astrology, a proud sophistry, as Pinkerton justly expresses it, which connects the little brief delliny of man with the vast rotation of innumerable suns and worlds. The education of the modern Persians is chiefly military; and their gross flatteries and obliquity of expression, evince, that they

PERSIA.

have totally forgotten the noble system of their ancestors, who, in the first place, taught their children to speak the truth. The low state of the arts and sciences in Persia is the more surprising, as education is exceedingly cheap. Children are taught at the schools, and afterwards at the "Madrassas," or colleges, to read and write their native tongue, Arabic, moral philosophy, metaphysics, and the principles of their religion. Some of these colleges are magnificent and richly endowed: they are built in a quadrangular form, with an open court in the centre, divided into a number of cells, which are appropriated to the use of the masters and their scholars. These colleges are principally indebted for their origin to kings and other great men, who look upon it as meritorious in the eyes of God and the prophet, to employ their wealth in pious and charitable foundations.

The *poetry* of the Persians abounds with the most sublime and varied images, as well as the most pathetic descriptions. There is no country, as it is said, where so considerable a knowledge of their best writers in poetry descends even to the lowest classes of the people. The most celebrated of the Persian poets are, as we have said, Sadi, Hafiz, and Ferdúsi. The writings of Sadi inculcate the doctrines of morality. Hafiz sings of love and wine; but many of his odes are received by his countrymen in a mystical sense, and are supposed to allude to the instability of the earthly happiness, and the duties which mortals owe to their creator. In the *Shahnamah*, the great production of Ferdúsi, the oriental scholar will discover passages, which would not, perhaps, disgrace the most eminent classical authors.

In *historical* composition, the Persians claim little consideration. All their works of this kind are written since the time of Mahomet, and are written, with few exceptions, in an inflated style, full of exaggeration and embellishment. Some of the Persian *romances* are very beautiful; but the most entertaining stories have never, for the most part, been committed to paper, and are only known from oral tradition. Story-tellers are common in this country, and the king always keeps one to amuse his leisure hours.

With regard to *science*, their knowledge is very limited; they possess some knowledge of algebra and geometry, and the most learned either really are, or pretend to be, acquainted with the writings of Euclid, Aristotle, and Plato, which have been translated into Arabic. Astronomy they regard as the most sublime of all studies, probably from its connection with astrology, to which they are, as we have said, much addicted. In physic and surgery they are grossly ignorant. In sculpture and painting the Persians have at no time attained to any degree of perfection. In architecture, as well as sculpture, the ancient Persians would appear to have surpassed their descendants, in proof of which we may refer to the ruins of Persepolis, Shuster, and Ctesiphon.

The general outlines of all the cities in Persia are the same. They are surrounded by a mud, and sometimes a brick wall, flanked at regular distances with round or square towers. The streets are narrow and dirty, having a gutter through the centre; and the houses, which are low, flat-roofed, and built of brick or mud, have each a small court surrounded by a high wall. They have seldom any windows to the street. The palaces of the nobility, though mean in their exterior appearance, are convenient and elegant within: they are divided into several courts, in the most retired of which is the "haram," or apartments of the women. The centre court is usually square, divided into parterres of flowers, with a jet d'eau continually playing before the window of the "dewan kana," or public hall. The walls and ceilings of this hall are ornamented with a profusion of paintings, and inlaid with looking-glasses; the floor is covered with

carpets and numuds; and one entire side of the room is occupied by large fash windows of painted glass. The apartments of the haram are often fitted up with great taste and magnificence; but the sleeping rooms allotted to strangers are generally small. The bazars, or market places, in some cities, particularly those of Lar and Shiraz, may be accounted handsome buildings; but the mosques, minarets, and colleges, are the chief ornaments of the Persian cities.

For an account of the manners and customs of the Persians in the 17th century, we refer to Chardin, Thevenot, Sanfon, and other travellers; and an idea of modern manners may be derived from the travels of Gmelin in Ghilan. The Persians still pride themselves in universal politeness and hospitality. With a conceit of their superior wisdom and sagacity, they blend a passionate temper; and their recent commotions have tainted their national character with cruelty. Their temperament is sanguine; and both rich and poor are generally gay, and indulge immoderate mirth after the most violent quarrels.

A late writer describes the Persians as "a remarkably handsome race of men; brave, hospitable, patient in adversity, affable to strangers, and highly polished in their manners. They are gentle and insinuating in their address, and, as companions, agreeable and entertaining; but, in return, they are totally devoid of many estimable qualities, and profoundly versed in all the arts of deceit and hypocrisy. They are haughty to their inferiors, obsequious to their superiors, cruel, vindictive, treacherous, and avaricious, without faith, friendship, gratitude, or honour." "Frugal in his diet, robust in his constitution, capable of enduring astonishing fatigue, and inured, from his infancy, to the extremes of heat and cold, hunger and thirst, nature seems to have formed the Persian for a soldier."

They are much attached to the fair sex, and not averse from wine. Their general complexion is fair, with a tint of olive; but those south about Shiraz, in Candahar, and in the provinces towards India, are of a dark brown. They are commonly fat, with black hair, high forehead, aquiline nose, full cheeks, and a large chin; and the form of the countenance is frequently oval. A Persian beauty is most esteemed when of middle stature, with long black hair, black eyes and eyebrows, long eye-lashes, fair complexion with very little red, small nose, mouth, and chin, white teeth, long neck, breast not full, small feet and hands, slender shape, and extremely smooth skin. In the purchase of Georgian and Circassian slaves, it is probable that these marks are as familiar as those of a beautiful horse among jockies. Those females that are Georgian slaves are extremely beautiful and highly animated, but they excel more in the grace and elegance of their persons than in the regularity of their features. They are sometimes brought from their native country, as an article of trade; but most of them are carried away by the Persian armies in their predatory incursions into Georgia. Their price varies according to the supply of the market. In 1810 a young and beautiful Georgian girl might be purchased for about 80*l.* sterling. In this country courtizans are not only common, but encouraged by the government; they are regularly licensed, and pay a duty to the state.

The men are generally strong and robust, and inclined to martial exercises; but they are particularly subject to disorders of the eyes. They commonly shave the head; but the beard is sacred, and an object of careful attention. To talk disrespectfully of his beard, is the greatest insult that can be offered to a native of this country; and an attempt to touch it would probably be followed by the instant death

PERSIA.

of the offender. The dress of the Persians consists of a long robe, reaching nearly to the feet, and a high cap, which, when covered with a shawl, has some resemblance to the ancient tiara. A sash is bound round the waist, in which a small dagger is stuck; and no person conceives himself dressed without a sword. They often wear three or four light dresses over one another, fastened with a belt or sash; and they are fond of large cloaks of thick cloth. The dress of the women is extremely simple: it is composed, in the summer season, of a silk or muslin shift, a loose pair of velvet trowsers, and an "ulkhaliq," or vest. The head is covered with a large black turban, over which a Cashmirian shawl is gracefully thrown, so as to answer the purpose of a veil. In the cold weather, a close-bodied robe, reaching to the knees, and fastened in front by large gold buttons, is worn over the vest. This is made of velvet, or "kimcob," and sometimes ornamented with jewels.

The natives of Persia do not recline on cushions, in the luxurious manner of the Turks, but sit in an erect posture on a thick felt, called a "numud." They seldom or ever have fire in their apartments in the coldest season; but in order to be warm, fold themselves in a fur pelisse, or a "kerounce," which is a handsome robe of crimson cloth, lined with shawls or velvet. They rise with the sun, and having dressed and said their prayers, take a cup of coffee, or some fruit. They then enter on the business of the day, if they have any; or else smoke and converse until about 11 o'clock, at which time they usually have their breakfast, and then retire into the haram. Here they remain until about 3 o'clock, when they return to the hall, see company, and finish their business. Between 9 and 10, the dinner, or principal meal, is served up. Boiled rice variously prepared, curries or pillaws, and mutton and fowl differently dressed, constitute their most usual dish; of which they eat moderately, but in a manner disgusting to European delicacy. Their meat is boiled to excess, and the meal is enlarged with pot-herbs, roots and fruits, cakes, hard eggs, and above all sweet-meats, of which they are very fond. Wine they never taste before company; although in private they are notorious drunkards, and invariably drink before they eat. They are passionately fond of tobacco, which they smoke almost incessantly through the whole day; and this constitutes the principal amusement of a man of fortune. Hunting and hawking, as well as various gymnastic exercises, are their favourite amusements. By these means their bodies become hardened and active; and as they are taught to ride from their youth, they manage their horses with great boldness and address. They frequently use the warm bath, but seldom change their linen. They are remarkable for cleanliness both in their persons and habitations. Circumcision is performed by a surgeon, sometimes within ten days after the birth, and at others ten years; but that of girls is unknown, and confined to the Arabs. Marriages are conducted by female mediation, and the ceremonies somewhat resemble the Russian. Polygamy is allowed, but the first married is the chief wife. Burials are conducted with little splendour, and the day of death is commonly that of sepulture. They believe that a particular angel is the sole author of death, by the special command of God: hence suicide is very rare, and duels absolutely unknown. The wives of the peasantry are employed in the management of the house; they never go abroad without covering the lower part of the face with a veil. In the higher circles, they are almost always confined to their cell in the haram, and chiefly pass their time in drinking coffee, and smoking the "calcan;" but agreeably to the practice of the Mahometans, little attention is paid to the improvement of their minds.

The government of Persia appears to have been always despotic. That of eastern Persia, or the kingdom of Candahar, is represented as mild; and it is to be hoped, that of western Persia, when firmly established, will assume the same character. The present monarch rules with an absolute sway, and he is under no restraint in the exercise of his power; and has an uncontrolled dominion over the lives and property of his subjects. Here is no senate or national assembly of any kind. The functions of government are exercised by the sovereign and his two principal ministers, the "vizier azem," or grand vizier, and the "ameen a doulah," or lord high treasurer. The former superintends every thing connected with foreign relations, and even commands the armies, in the absence of the king or the prince. The latter, who is subordinate to the other, principally attends to internal arrangements, such as the collection of the revenues, and the cultivation of the lands. Subordinate to the ministry is a regular gradation of officers, who occupy posts in the household, army, and revenue departments. The governors of the provinces assume the title of "beglerbegs;" those of the districts that of "hakim," or "zakit;" and each village is under the management of a "khet khodah." The jurisprudence of this empire is founded, as in other Mahometan states, on the doctrines of the Koran. The "schiek ool islam" is the nominal judge of civil and criminal law; but the governors of the different towns and provinces are, in reality, the persons who decide in cases of importance. In the capital the king himself daily sits in judgment, and the award is not always consonant to justice. The most common punishments to men of exalted rank are death and deprivation of sight; and to those of the lower orders, mutilation and the bastinado on the soles of the feet. Theft is a crime always punished with the most unrelenting severity. The body of the culprit is sometimes torn asunder, by being bound to the branches of trees afterwards separated. Trifling disputes are, in general, settled by the "cazi" and "daroga" of the bazars.

The standing army of the empire, as it may be called, consists of the king's body guard, amounting to about 10,000 men, and the "gholaums," or royal slaves, who are about 3000. But the military force of the Persian empire is constituted by the number and bravery of the wandering tribes. When the sovereign wishes to assemble an army the chiefs of the different tribes are commanded to send to the royal camp a number of men, proportioned to the power and strength of each tribe. The army, thus assembled, consists chiefly of cavalry; and as they seldom receive either clothing or pay, they are only kept together by the hope of plunder. The present king, by an extraordinary effort, might probably, in this way, be able to collect together a force of 150,000 or perhaps 200,000 men. The rulers of Persia have entrusted the defence of their dominions to the cavalry, which is excellent. Their arms are a scymetar, a brace of pistols, a carabin, and sometimes a lance, or a bow and arrow, all of which they use alternately, at full speed, with the utmost dexterity. The pistols are either stuck in the girdle, or in the holsters of the saddle; the carabin or the bow is slung across the shoulder; and the lance, which is light and shafted with bamboo, is wielded in the right hand. As the Persian armies receive no regular pay, but are kept together merely by the hope of plunder, it is considered as incumbent on the king to take the field once a year, against the Russians, Afghans, or Turcomans, his immediate neighbours. But they know nothing of war as a science; and they are entirely ignorant of the principles of fortification, and of the arts of attack and defence. The chief artillery is composed of "zumbarooks," or small swivels,

PERSIA.

swivels, mounted on and fired from the backs of camels. Their roads do not allow of the transportation of cannon. In the organisation of their armies they are in total want of good officers, and consequently no proper subordination prevails among them.

The state of the people seems to be deplorable, under the arbitrary power of the numerous khans or chiefs. As to the population of Persia, it cannot be justly estimated; but perhaps it little exceeds that of Asiatic Turkey, which has been computed at 10 millions. Of these perhaps six millions may belong to western Persia; while the other four contribute towards the population of the kingdom of Candahar. The population of the Persian empire was estimated by Chardin at about 40 millions of persons; but this estimate is universally allowed far to exceed the real amount. A modern writer (Mr. J. M. Kinneir) questions whether the inhabitants of all the countries between the Euphrates and the Indus would now be found to amount to more than 18 or 20 millions; including in this computation the "Illians," or wandering tribes, who probably exceed in number those who reside in towns. These tribes constitute the military force; and their chiefs, to whom they are entirely devoted, the hereditary nobility of this great empire. These are of Turkish origin, and still speak the language, and preserve the manners of their Scythian ancestors. The land granted to each tribe, on its introduction to the country at a remote period, is now, in consequence of long possession, considered as the property of the different chiefs. These tribes, for the most part, follow the pastoral life. Their tents are walled with mats, and covered with a coarse kind of black cloth, manufactured by themselves. In the fine season they are moving in search of pasturage; but in winter, several of the tribes settle in villages. In Dalufstan, Astrabad, and the northern parts of Khorasan, they live in small portable houses, instead of tents. They principally subsist on the produce of their flocks, and grow little corn. They manufacture cloth, and several other smaller articles for their own use; and the most beautiful Persian and Turkish carpets, so much admired in Europe, are the works of the Illians. Inured from their infancy to every danger and fatigue, and tenacious, at the same time, of the honour of their tribe, they are at once the prop and the glory of their country. Each tribe is divided into "teeras," or branches; and each "teera" has a particular leader, all of whom are, however, subservient to the chief. The chiefs are, from birth and influence, the first men in the empire: they are always mutually jealous and hostile; and the king, by fomenting their quarrels, and thus nicely balancing the power of the one against that of the other, insures his own safety, and the peace of his dominions.

The most numerous and powerful of the Persian tribes are the Búcktiari, who furnish the best infantry in the kingdom, and the Fielhi, both of whom pitch their tents in the fertile districts of Lauristan, between Shuster, Ispahan, and Kermanshaw; the Afshar, to which Nadir Shah belonged, dispersed all over the kingdom; the Kafar, of which the present king is the head, who are in possession of Astrabad and Mazanderam; and the Karagoozh, or black-eyed tribe, who inhabit the plains of Hamadan, and who are esteemed the finest horsemen. The Búcktiari and Fielhi live in a remote and very mountainous territory, bordering on the Turkish and Persian empires, and in a great measure independent of both, are at best but a lawless and savage banditti. They possess the country of the Cossaens and Uxiars, whose habits they also resemble.

The army of western Persia united, and somewhat inflated in prosperity, might amount to about 100,000

effective men, and this probably may be the amount of that of Candahar. The chief merchants in Persia are the Armenian Christians and the Hindoos, so that the commerce of the country has been always in the hands of strangers. The name of a warlike navy has been altogether unknown. The revenue of Persia cannot be accurately ascertained; but it is thought probable that the monarch of Candahar may clear from his various provinces about three millions sterling; while western Persia scarcely supplies two millions. The whole revenue has been by some estimated at 700,000 toman, the toman being computed at about 3*l.* 7*s.* or about 32 millions of French livres. The revenue, as stated by the writer above named, does not much exceed three millions, and is derived from two sources; the tax on land, and the duties and imposts on all kinds of merchandize. This writer suggests, that the tax on land belonging to the crown or to individuals, may probably amount to two-thirds of the whole.

The capital city of Persia is Ispahan, which see: and the second city is Shiraz, which also see. The other cities are Teffis, Derbent, Erivan, Tebriz or Tauriz, Rasht, Sari, Bistam, Khavar, Tahiran, Casbin, Sultania, Hamadan or Amadan, Kom, and Cashan, which see respectively. On the banks of the Ahwaz, or ancient Choaspes, Kiab and Ahwaz are of small account: nor is Toftar, or Shuster, though the capital of a province, of much account. In the proximity of the Persian gulf, Kazerun, Firuzabad, and Jarun or Yaran, hardly deserve mention. Lar (which see,) is the capital of a province. For the towns on the Persian gulf, see *PERSIAN Gulf*. Tiz and Gaudal are two ports on the coast of Mekran, of no great importance. The capital of Kerman is Yezd, which see. North of Yezd is Hirabad, which see. The other cities of western Persia scarcely deserve commemoration. In passing to the eastern division, or the kingdom of Candahar, we find Cabul, the metropolis, and Candahar, a city of small size, chiefly worthy of notice as the grand passage between these extensive empires. Zarang is supposed to equal any city in Segistan; and the other chief towns on the Hindend are Dargasp, Bost, and Rokhage or Arokhage. The dominion of Zeman Shah comprises a considerable portion of Korasan. Here we find Herat, Mefchid, &c. The southern province of Mekran naturally coincides in allegiance with Segistan and Sindi to the empire of Candahar: but its northern limits have not been defined, though major Rennell informs us that they include Gaur, a considerable city and province. Bamian belongs to the same portion of Bucharia. After this cursory mention of some of the principal places in eastern and western Persia, we refer for a more particular description of them to the articles that occur under their respective names.

The manufactures and commerce of Persia may be said to be annihilated; though a few carpets still reach Europe at extravagant prices. The trade with Russia and the Caspian is of small account, consisting of salt and naphtha from Baku, and some silk from Shirvan and Ghilan. The Persian merchants also bring goods to Balfrush, the largest town in Mazanderam, where they trade with those of Russia. On this subject the reader will derive satisfactory information from the *Travels* of Mr. Hanway; the second edition of which was published in 2 vols. 4to. 1754. From Chardin we learn what was the state of the manufactures and commerce of this country in the 17th century. Embroidery on silk, cloth, and leather, had attained high perfection: earthen-ware was made throughout Persia; but the best was that of Shiraz, Mefchid, Yezd, and Zarang, where it was singularly beautiful, equalling the Chinese porcelain

PERSIA.

porcelain in fineness and transparency: some sorts resisted fire, and the fabric was so hard as to produce lasting mortars for grinding various substances. (See MURRINE.) The manufactures of leather and shagreen were also excellent; and they were distinguished for their braziers, using the tin of Sumatra for lining their vessels. The bows of Persia, its finely damasked fabrics, its razors, and other works in steel, were in high estimation; and the Persians excelled in cutting precious stones, and dyeing bright and lasting colours. Their cotton and woollen cloths, and those made of goats' and camels' hair, with their silks, brocades, and velvets, were superior manufactures. The carpets, chiefly from the province of Segistan, were brought to Europe through Turkey, and in Chardin's time called Turkey carpets: they were valued by the number of threads in the inch, being sometimes 14 or 15. The stuffs made of camels' hair were supplied chiefly from Kerman, and those of goats' hair from Mazanderam; but the cotton cloths were obtained principally from Hindoostan; but the fabric of broad cloth was unknown, and supplied by a kind of felt. The standard native merchandize was silk. To Hindoostan were sent tobacco, preserved fruits, especially dates, wines, horses, porcelain, and leather of different colours: to Turkey, tobacco and kitchen utensils: and to Russia, manufactured silks. The little commerce which the country now enjoys is principally carried on by the Armenians, whose habits, migrations, and industry, bear some resemblance to those of the Jews. They are scattered over the kingdom, and are held in greater respect by the Persians than is consistent with the intolerant precepts of the Koran. They seldom intermarry with any other sect, and preserve inviolate the religion and customs of their ancestors. As they are never allowed to interfere either in political or military concerns, their cowardice is proverbial. The principal colony of Armenians was that brought from Julfa, on the banks of Araxes, and established by Shah Abbas the Great at Ispahan. This colony, in the time of Chardin, amounted to 14,000 families; but the tyranny of the Afghans, and subsequent civil wars, have reduced the extensive and beautiful suburb of Julfa to a heap of ruins, and its inhabitants to about 400 families. The Armenians, however, are not confined to Ispahan, but are to be found in all the commercial towns of the empire. The chief imports from India are sugar, indigo, spice, cloths, piece goods, chintz from Masulipatam, woollen cloths, cutlery, and other European articles. From Astrachan, cutlery, woollen cloths, watches, jewellery, arms, and fine glass are imported. The returns for these articles are bullion, raw silk, pearl, shawls, carpets, wine, and horses.

The climate of Persia is various in different parts; depending less on difference of latitude, than on the nature and elevation of the country, so that it is said to be the country of three climates. The northern provinces on the Caspian are comparatively cold and moist: in the centre of the kingdom, as Chardin observes, the winter begins in November, and continues till March, commonly severe, with ice and snow, the latter falling chiefly on the mountains, and remaining on those three days' journey W. of Ispahan for eight months in the year. From March to May high winds are frequent; but from May to September the air is serene, refreshed by breezes in the night. The heat, however, is during this period excessive in the low countries, bordering on the Indian ocean and Persian gulf, in Chulistan, the deserts of Kerman, and also in some parts of the interior, particularly at Tehraun, the capital. From September to November, the winds again prevail. In the centre and south the air is generally dry; thunder and

lightning are uncommon; and a rainbow is seldom seen: earthquakes are almost unknown; but heat is often destructive in the spring. Near the Persian gulf the hot wind, called "Samiel," sometimes suffocates the unwary traveller. The summers are, in general, very mild, after ascending the mountains. To the N. of Shiraz the winters are severe, inasmuch, that in the vicinity of Tehraun and Tabreez, all communication is cut off, for several successive weeks, between these cities and the adjoining villages. The climate, notwithstanding this sudden transition from heat to cold, is singularly healthy, with the exception of the provinces of Ghilan and Mazanderam. The air is dry; the dews not insalubrious. The atmosphere is always clear, and at night the planets shine with a degree of lustre unknown in Europe; and as it seldom rains, here are none of those damps or pestiferous exhalations so common in the woody parts of Hindoostan.

The distinguishing features of this country are a deficiency of rivers and a multitude of mountains: its plains, where they occur, are generally desert. So that Persia may be divided into two parts by deserts and mountains, and this division, it is said, has generally influenced its history and destinies in all ages. The soil may be regarded as unfertile, and, according to Chardin, not more than one-tenth part was cultivated in his time. The mountains of this country, which are for the most part rocky, without wood or plants, are interspersed with vallies, some of which are stony and sandy, and some consisting of a hard dry clay, which requires much watering; and hence the Persian farmer is much employed in irrigation. What has now been said relates to the central and southern provinces; those in the north being sufficiently rich and fertile. The most common grain of Persia is wheat, and this is excellent. Rice is a more universal aliment, and regarded by the Persians as delicious: this is generally produced in the northern provinces, those being the best watered: barley and millet are sown; but oats are little cultivated. In Armenia there is some rye. The plough is small, and drawn by lean cattle, so that it merely scratches the ground. After the plough and harrow, the spade is used for forming the ground into squares, with ledges or little banks to retain the water. The dung is chiefly human, and that of pigeons mingled with earth, and preserved for two years to diminish its heat. In the N.W. countries the vines are interred during the winter; and when insects attack the tree, they lay fresh earth to the roots. The nature of the soil in this country varies almost as much as the climate; in the southern and eastern provinces it is light and sandy: in the western and interior parts, hard and gravelly; and in the northern division, which borders on the Caspian sea, rich and loamy. The silk worm is cultivated in most parts of the country, but particularly in the province of Ghilan, and the vicinity of Kashan; cotton, indigo, and tobacco, are also raised; and no country can exceed this in the variety or flavours of its fruits. The present depressed state of agriculture is owing, in a great measure, to the unsettled nature and disposition of the government, which affords no protection to private property, and offers no encouragement to industry.

The rivers of Persia, not taking into account the Euphrates, Tigris, and Indus or Sinde, which are not properly Persian, are the Ahwaz (supposed by some to be the Gyndes of Herodotus), the Zeindeh of d'Anville, and called by the Turks Kara Sou (see KARASA), or the black river; which is reckoned one of the most considerable in Persia, and pursues a course of about 400 British miles, from the mountains of Elwend to the estuary of the Tigris and Euphrates:—the Rud, or Divrud, the principal of those
rivers

PERSIA.

rivers that flow from the range of mountains in the N.E. and fall into the Persian gulf:—the Krenk and Mekshid, rivers of Mekran, which join and form the river of Mend, so called from a town by which it passes:—the Haur and the Araba, the latter of which serves as a boundary towards Hindooftan:—the large river of Gihon, or Amu, in the N.E.:—the river Tedjen, or Tedyen, to the W., being the ancient Ochus, and flowing into the Caspian:—the Kizil Ozen, or Sefid Rud, rising, according to d'Anville, in the mountain of Elwend, not far N. of Hamadan, and by a winding course running into the Caspian; which river is the Mardus of antiquity,—and the Swidura of Gmelin, rising on the confines of Turkey, and falling into the sea below Langorod; abounding in pike, carp, and other kinds of fish, esteemed by the Persians; and, as Gmelin says, in sturgeons:—farther to the N., the large river Aras, the ancient Araxcs, which falls into the Kur or Cyrus (see KUR):—the central rivers of Persia, soon lost in sandy deserts, are the Zenderud, rising in the western chain of Elwend, passing by Ispahan, and soon after losing itself in the sand:—the Koh Asp of d'Anville, the Correng of Chardin, which passes by Shuster:—the Bundamir (which see):—the Kuren, a considerable stream from the N.E. that flows into the lake Baktegan:—and the Hinmend, or Hindmund, which see.

The lakes of Persia are the Aria Palus of antiquity (see ARIA):—the salt lake of Baktegan (which see):—the large lake of Urmia (see URMIA):—the lake Van:—and the lake of Erivan, about 120 British miles to the N. of Urmia, about 25 leagues in circumference, with a small isle in the middle: this lake abounds with carp and trout, and is the Lychnites of Ptolemy.

In presenting to our readers a brief view of the mountains of Persia, the first object that merits attention is the direction of its chief chains. To these we may refer the Caucasian ridge (see CAUCASUS):—the Hindoo-Kho, which is an extension of the Belur-Tag (see both these articles):—the Elwend, so called from a particular mountain in the vicinity of Hamadan, and reckoned the greatest chain of mountains in Persia, of very great height, extending to the south of the lake of Urmia, where it is connected with the Caucasian ridge:—a parallel ridge on the W., called by the Turks Aiagha Tag, supposed to be the Zagros of the ancients, which separated Assyria from Media, and extending to the lake of Van:—and Hetzardara, (which see). Chardin considers the noted Damavend of the Persians, as a ridge dividing Hyrcania from Parthia; that is, in other words the mountains of Mazanderam; and he adds that of the mountains between Fars and Kerman, the most remarkable is called Jaron; but the mountains of Kurdistan alone present forests. The great western range of mountains is called in some parts the mountains of Loozistan; and more to the S. the Adervan and Dinar, with Ajuduk, N. of Lar. It detaches some remarkable branches to the S.E., as that on the W. of Kom, Cathan, Nathan, &c. which from a particular mountain may be called the range of Elburz. Another branch spreads to the S. of Ispahan, which d'Anville considers as the same with what the Persians call the thousand mountains, or Hetzardara. Still more to the S. a large and extensive branch extends between the rivers Kuren and Bundamir; and presents on the western side of its further extremity the noted ruins of Persepolis. The pass of Khavar is near the southernmost extent of the Caucasian heights of the Mazanderam; and Mr. Pinkerton thinks there is no reason for believing that any ridge extends into the great Saline desert. We learn from Mr. Forster that there are no ranges from Candahar to Korafan. Herat stands on a plain; but to the N. of Dochabad and Turshiz, there is a range of moun-

tains covered with snow. About three miles E. of Khana-hoody, a chain of mountains of some height extends N. and S.

Some have represented the province of Fars as separated from Kerman by a range of mountains; but the real barrier is a desert of sand, extending from the S. of the lake Baktegan to the proximity of Zarang, and connected with the great desert which divides Persia into two parts. There are no mountains of consequence on the E. of Fars. A low range, called Meder by d'Anville, passes N.E. through the heart of Kerman; while that country is divided from Mekran by a range in the same direction, called by d'Anville Kofez. Some other nameless ranges traverse Mekran in the same direction; that nearest Hindooftan being called by Rochette the Lakhee mountains. On the N. of Mekran, a considerable range runs E. and W. which has not been named by d'Anville; but it seems, says Pinkerton, to be the Beticus of Ptolemy. Further to the N., the mountains of Wulli extend from the neighbourhood of Shatzan across to the lake of Vaihind, and may be considered as forming one range with that on the N. of Mekran, called by La Rochette Gebelabad. This range however terminates in the great desert to the S. of Zarang. In the E. of Segistan there is a ridge N. and S. called Soliman Koh, or the mountains of Soliman. It is probable also, that there are mountains of considerable height on the N. and W. of the sea of Zurra; one called Berfhek, and another Ouk, the former being noted for a fire-temple, the resort of the Guebres or Gabres.

The deserts of Persia are the following: on the E. of the Tigris, N. lat. 33°, a considerable desert commences, pervaded by the river Ahwaz, and extending to the N. of Shuster, which is about 140 British miles in length from E. to W., and about 80 in breadth, and is now inhabited by the wandering tribe of Arabs called Beni Kiab.

The great Saline desert extends from the vicinity of Kom, or Koom and Kashan, to that of the sea of Zurra, in a line from E. to W. of about 400 British miles, and from N. to S. in breadth about 250; but joining in the latter quarter with the great desert of Kerman by the Nauben Dejian, which extends about 350 miles. These two extensive deserts may thus be considered as stretching N.W. and S.E. for a space of about 700 miles, by a medial breadth of about 200 (not including in the length the other 200 miles of the desert of Mekran); thus intersecting the wide empire into two nearly equal portions. This immense extent is impregnated with nitre and other salts, which taint the neighbouring lakes and rivers. In the bay of Mekran, and towards the Indus, are other deserts of great extent.

A third great desert, that of Karakum, or the black sand, forms the northern boundary of Korafan and modern Persia. The desert of Margiana is placed by Ptolemy on the N.W. of Aria; and if, with d'Anville, we suppose Margiana to have derived its name from the river Margus, or Morgab, this desert may be in the vicinity of Badkis.

The Persian forests are restricted to a few spots in Korafan, the mountains of Mazanderam and Ghilan, and those towards Kurdistan. But timber is chiefly supplied by Mazanderam, which from this circumstance receives a name signifying the land of oxen.

The indigenous vegetables of Persia are very much unknown. The saline deserts are for the most part destitute of trees, and support hardly any plants except those that are also found on the sea-shore. On the high mountains they are much the same as those observed on the Alps of Switzerland and Italy. The plants on the hills and plains adjoining the Caspian are better known. On the mountainous ridges are
found

PERSIA.

found the cypress, the cedar, and several kinds of pines, while the lower hills and scars of rock are shaded and adorned with lime-trees, oaks, acacias and chestnuts: the fumach is also abundant, and the fraxinus ornus, or manna ash-tree, is less common. The most esteemed of the cultivated fruits of Europe are indigenous in Persia, and have probably been diffused from hence over the whole west. These are the fig, the pomegranate, the mulberry, the almond, peach and apricot. Orange-trees of an enormous size are found in the sheltered recesses of the mountains, and the deep warm sand on the shore of the Caspian is peculiarly favourable to the culture of the citron and the legumina. Apples, pears, cherries, walnuts, melons, besides the fruits already mentioned, are every where to be procured at very low prices; the quinces of Ispahan are the finest in the East; and no grape is more delicious than that of Shiraz. In the provinces bordering on the Caspian sea, and mount Caucasus, the air is perfumed with roses and other sweet-scented flowers. Among the vegetable productions we may enumerate cabbages, cucumbers, turnips, carrots, pease, and beans; and the potatoe, which has been lately introduced, thrives remarkably well. Poppies, from which an excellent opium is extracted, fenna, rhubarb, saffron, and assafœtida, are produced in many parts of the kingdom. The vine grows here luxuriantly, and further to the S. cotton and sugar are articles of common cultivation. Poplars, large and beautiful, and the weeping willow, border the course of the streams, and the marshy tracts abound with the kind of rush that serves for the fine Persian matting. Ornamental shrubs or herbaceous plants are little known; but the jasmine, the blue and scarlet anemone in the thickets, and the tulip, and ranunculus in the pastures, are abundant and beautiful, and give an air of elegance to the country.

According to Chardin, the Persian horses are the most beautiful in the East; but they yield in speed, and, as some say, in beauty also, to the Arabian. However, they are larger, more powerful, and all things considered, better calculated for cavalry than those of Arabia. There are several breeds of horses, but the most valuable is that called the Turkoman, which are so hardy, that they have been known to travel 900 miles in eleven successive days. The Arabian blood has also been introduced into this country. Their usual food is chopped straw and barley; their bed is made of dung, dried and pulverized, and every morning regularly exposed to the sun. They are clothed with the greatest attention, according to the climate and season of the year; and during the warm weather kept in the stable during the day, and taken out at night.

Mules are also here in considerable request; and the assembles the European: but a breed of this animal has been brought from Arabia, of an excellent kind, the hair being smooth, the head high, and the motion spirited and agile. Although the mules are small, they are fairly proportioned, carry a great weight, and those that are intended for the saddle are taught a fine amble, which carries the rider at the rate of five or six miles an hour. The camel is also common; and these animals are exported from Persia to Turkey, which have, as Chardin says, only one hunch, while those of India and Arabia have two. The Persian cattle in general resemble the European: swine are scarce, except in the N.W. provinces. The flocks of sheep, among which are those with large tails, are most numerous in the northern province of Erivan, or the Persian part of Armenia, and Balk. The few forests abound with deer and antelopes; and the mountains supply wild goats, and probably the ibex, or rock goat. Hares are common. The ferocious animals are chiefly concealed in the forests, such as the bear and boar, the lion in

the western parts, the leopard, and as some say, the small or common tiger. Seals occur on the rocks of the Caspian. The hyæna and chackal belong to the southern provinces. The seas abound with fish of various descriptions: the Caspian affords sturgeon, and delicious carp. The most common river-fish is the barbel. The same sorts of wild and tame fowl are common in Persia and in Europe, with the exception of the turkey, whose nature does not seem to be congenial to this climate. Pigeons are numerous, and partridges are large and excellent. The boobul, or oriental nightingale, enlivens the spring with his varied song.

The Persians have been long accustomed to tame beasts of prey, and even to hunt with lions, tigers, leopards, panthers, and ounces.

As to the mineralogy of this country, it affords neither number nor variety of treasures. Chardin assures us, that it has no mines of gold or silver. The lead mines of Kerman and Yezd produce the usual mixture of silver. In the northern provinces there are many mines of iron, but the metal is harsh and brittle. Mines of steel ore, or carbonated iron, are also wrought in the same districts, and these are so impregnated with sulphur, that the filings, when thrown in the fire, flash like gunpowder. Copper is chiefly found on the mountains of Mazanderam, and near Casbin, but it is brittle. There are two mines of the turquoise, one at Nishapour in Korasan, and another in a mountain called Feruzkoh, S. of the Caspian. The pearls of the Persian gulf have been long famous. (See PEARL.) Otter, an intelligent traveller in Persia, says, that among the articles sold in the bazars of Ispahan are diamonds of Golconda; rubies, topazes, and sapphires of Pegu; emeralds of Said or the Thebais; and balay rubies from Bedakshan, a country between the rivers Gihon and Murgab, which also produces lapis lazuli, amianthus, and rock crystal. Sulphur and nitre are found in the mountains of Demavend: whole deserts are, in some instances, covered with sulphur, and others with salt, that near Cashan being remarkably pure. Rock-salt is found near Ispahan, and in the dry climate of Kerman, if we may credit Chardin, it is even employed in building. Free-stone, marble, and slate, are chiefly obtained from Hamadan; and near Tauriz is a marble, as Chardin calls it, which is transparent, like rock-crystal, through tables an inch in thickness, of a white colour, blended with green, probably a kind of jade. Towards the Tigris are pools of bitumen, or rock-tar, and naphtha abounds near Baku. In Erivan and Fars are mines of talc, and of a pure white marl used like soap. For an account of the mumia of Korasan, see MUMMY. Although mineral waters abound in this mountainous country, they are generally disregarded both by the physicians and the people.

Barbarous princes seem to have entertained the idea, that bad roads contribute to the security of their dominions. The Turks and Persians are, without doubt, of this opinion; for the public highways, and particularly those that lie towards the frontier, are very much neglected. The only mode of travelling is by riding either a mule or an ass. For women of high rank, and for sick persons, there is, indeed, a vehicle, called a "tukte rowan," which is transported by two mules, one before and the other behind; but the women and children of the poor are carried in baskets, slung across the back of a mule or camel. The length of the stage (which sometimes exceeds forty miles), and badness of the accommodation, render travelling very unpleasant. Here are no regular establishments for the transmission of intelligence, and therefore it is necessary for the dispatch of letters from one part of the kingdom to another

another, to send a "chupper," or express horseman, or a messenger on foot, who is called "caffid." Although the distance be ever so great, the chupper seldom changes his horse; for in Persia, there are no post-houses and relays of horses as in Turkey. They travel at the rate of four or five miles an hour, and have been known to go from Tebraun to Busheer, a distance of 700 miles, in the space of ten days. The caffids will also travel for many days successively at the rate of sixty or seventy miles a day.

Among the chief natural curiosities of this country, we might mention the fountains of naphtha, in the vicinity of Baku, and in the adjoining promontory of Absheron; and the blue flame issuing from the ground, and particularly from an horizontal gap, about sixty feet long by three broad, in a neighbouring rock. The naphtha is much used by the Persians, and particularly by the poorer sort, as we use oil in lamps, or to boil their victuals, though it communicates a disagreeable taste. That which is white, and of a thinner consistency, and which is found only in small quantities, is drank by the Russians both as a cordial and a medicine; taken internally, it is said to be good for the stone, for disorders of the breast, and in venereal cases and sore heads. Externally applied, it is said (see Hanway's Travels, vol. i.) to be of great use in scorbutic pains, gouts, cramps, &c. It has also the property of spirits of wine to take out greasy spots in silks or woollens, but it leaves after the use of it an abominable odour. They say it is carried to India as a great rarity, and being prepared as a japan, is the most beautiful and lasting of any that has been yet found. Near the spot where this naphtha is procured are springs of hot water, which boil up in the same manner as the naphtha. Bathing in this warm water is found to strengthen and procure a good appetite, especially if a small quantity of it is drank. These remarkable springs have been described by Kämpfer at the end of the 17th century, by Gmelin in 1773, and more fully by Hanway *ubi supra*. In an adjoining peninsula there are many other wells; and the revenue arising from this uncommon product to the khan of Baku is computed at 40,000 rubles. See *Everlasting FIRE*.

The progressive geography of this celebrated country may be traced through Strabo, Pliny, the historians of Alexander, and other classical sources, and afterwards through the Arabian authors, Ebn Hankel, Edrisi, Abulfeda, &c. &c. to the modern labours of Chardin, Hanway, Franklin, Gmelin, Pallas, &c. &c. We have been principally indebted for the materials of this article to the compilation of Mr. Pinkerton, in the 2d volume of his Geography; to the 6th Discourse of Sir William Jones; to Hanway's Travels; and Kenner's Geographical Memoir on the Persian Empire, 1813.

PERSHAH, a town of Hindoostan, in Baglana; 18 miles E.S.E. of Basseen.

PERSIAN Empire, and Monarchy. See MONARCHY.

PERSIAN Gulf, called also the *Sea of Omar*, and the *Green Sea*, a sea or inland lake, bounded on the north by Persia, and elsewhere by Arabia, except at the eastern extremity, where it communicates with the Arabian sea; about 500 miles from E. to W., and from 120 to 250 in breadth, from N. to S. The principal river which runs into it is the Euphrates. The southern coast in particular has been celebrated for its pearl-fishery. (See PEARL.) The coasts both on the N. and S. belong chiefly to colonies of Arabians. This celebrated gulf has been always more remarkable for the factories of foreigners, than for its native establishments. Bender-Abassi was a port opposite to the isle of Ormus, or rather on the coast between Ormus and Kishmish, or Kishma, and is now more commonly known

by the name of Gombroon. The trade, once considerable, is now greatly declined; and even the Dutch left it, and settled in the isle of Karek or Garek. The French Indian commerce has failed; and the English staple is Bassora. But Busheer, and Rik, or Bundarik, are also sometimes frequented. See these several places under their appropriate denominations.

The Arabian shore of this gulf has never been surveyed; and as it has many sand-banks and shoals, the navigation is difficult and dangerous. The Persian shore is more elevated than that of Arabia; and the islands with which the gulf abounds are chiefly on that side. This is a safe coast, on which, generally speaking, there are regular soundings, and ships may almost every where procure shelter from violent gales of winds, either in bays or under the lee of the islands.

The promontory of Cape Mufledom (called by the natives Ras-ul-Gibel), at the entrance of the gulf, and on the Arabian shore, is said to be the termination of a mountainous tract, inhabited by a tribe of persons descended from a mixture of Arabs and Portuguese, who have hitherto bravely resisted the encroachments of the Wahabees. The small islands, or rather rocks, called the "Quoins," lie about ten miles to the N. of the Cape, and the channel between them is reported to be free from danger. At Rams, a piratical town, N. lat. 25° 53', the mountains retire, and the water begins to shoal. From this place, to the town of Shorga, a distance of seventeen leagues, it is hazardous for ships to approach the coast, owing to the prevalence of the N.W. winds. From Shorga to Granc, a large town in N. lat. 29° 12', the coast is denominated by the Arabs "The Coasts of Danger." It is unknown to Europeans, and supposed to abound in coral and pearl banks. The greatest part of the Arabian shore is in the possession of the Joasmi Arabs, a licentious band of pirates, who, by their depredations, obstruct the commerce of the gulf. Their principal rendezvous is Ras-ul-Khyma, a town about seven miles S.W. of Rams. At the mouth of the gulf is the celebrated island of Ormus or Hermus. (See ORMUS.) Larrek is a small island, ten miles S.S.W. of Ormus, about fifteen miles in circumference. The largest island in the gulf is Kishm, or Jezira Derauz, *i. e.* Long Island. (See KISHMA.) On the S. side is a most excellent harbour formed by the island of Angar. This is completely encompassed by the two islands, which are not above three miles distant from each other, so that a ship can anchor close to either shore at all seasons, there being a sufficient depth of water for a line of battle ship lying within half a mile, and small craft within one hundred yards of the shore. No pilot is necessary. The island of Angar is somewhat longer than Ormus, now uninhabited, though formerly well peopled. The Great Tomb is a low island, about three miles in length, and two and a half broad, distant eleven leagues from the S. point of Angar, N. lat. 26° 20'. The Little Tomb is rather less, and distant from the former four miles, a barren and rocky island. Bafman lies eleven leagues N.N.W. $\frac{3}{4}$ from Shorga, N. lat. 25° 54', about five miles long, remarkable for a high round hill in its centre, and uninhabited. Polior, the Pulora of the Greeks, is about five miles long, and four broad, uninhabited, encompassed with deep water, and having a long reef of dangerous rocks running out from its W. extremity, the northern end being in N. lat. 26° 20' 30". Surdy lies in the meridian of Polior, and the parallel of Bafman, and is much such an island as the latter. Nabfleur is a small uninhabited island, without vegetation, ten miles S.S.W. of Polior. Ken, the ancient Kataia, is flat, and better planted than most of the islands in the gulf. Formerly it had a

flourishing commerce, and now it can supply ships with refreshments. The S. end is in N. lat. $26^{\circ} 27'$, about 10 leagues N.E.N. $\frac{1}{2}$ N from Polior. Anderavia, or Inderabia, seven leagues from Ken, is a low, level, and narrow island, about three miles in length, N. lat. $26^{\circ} 40'$. Busheah, inhabited and covered with date trees, is about sixteen miles in length, and five or six in breadth. The island of Bahrein is one of the finest in the gulf. (See BAHREIN.) Tarent, close to the shore, and opposite to Kalif, although not so large, is a finer island than Bahrein, about seven miles long, and as much in breadth, well supplied with good fresh water, and embellished with many delightful gardens, which produce abundance of fruits of various kinds. The island of Karrack, the Icarus of Arrian, contains about twelve or thirteen square miles; affords a good anchorage at all seasons, mostly rocky, supplied with abundance of wax, and now peopled with about three or four hundred inhabitants, who subsist by gardening and fishing. The island of Corgo, lying about one and a half or two miles N. of Karrack, contains about two square miles, and is of a light sandy soil: it has plenty of water, though not so good as that of Karrack, uninhabited, but not incapable of cultivation. It will produce both wheat and barley during the rainy seasons. Kinneir's Geog. Mem. of the Persian Empire.

PERSIAN Language, one of the living oriental languages; spoken in the empire of Russia.

The Persian language is rich, melodious, and elegant; it has been spoken for many ages by the greatest princes in the politest courts of Asia; and a number of admirable works have been written in it by historians, philosophers, and poets, who found it capable of expressing with equal advantage the most beautiful and the most elevated sentiments. Accordingly sir William Jones very much laments the neglect of this language that has generally prevailed among the learned; and he recommends the acquisition of it by a variety of considerations; but particularly from its utility to those who transact the concerns of Europe in India. In order to facilitate the attainment of it, he has published an excellent compendious grammar, and prefixed to it some instructions relating to the best method of learning this language. We shall avail ourselves of his work in giving an abridged history of the Persian language, and then some account of the language itself. The history of the Persian tongue may be divided into four periods, like that of the empire; and under each dynasty there was an apparent change in the dialect of the kingdom, especially under the two last, viz. the "Sassanian" and "Mohammedan" dynasties; and these are the only periods, of which any certain records remain. In the infancy of the Persian empire, under Cayúmaras and his descendants, it cannot be supposed that any great pains were taken to polish the language, which, if it were sufficiently clear and intelligible, would not be thought to want elegance. Herodotus assures us, that even after the reign of Cyrus, the whole education of the Persian youth, from the age of five years to twenty, consisted in only three points, riding, throwing the javelin, and the practice of moral virtue; which account is also confirmed by Xenophon. Nevertheless it ought not to be imagined, that the ancient Persians, especially those of the second period, were entire strangers to the art of composition either in verse or prose; but what their language was, what were their rules of verification, or what was the course of their studies, no mortal can pretend to know with any shadow of exactness. The Greeks can give us no assistance, nor are we much enlightened by the writers after Alexander; it is necessary therefore to consult the Persians themselves. From the great traveller

Chardin, we learn, that the old Persian is a language entirely lost, in which no books are extant; and of which there are no rudiments remaining. (See PERSIA.) We have therefore no account of the Persian language till the time of the "Sassanian" kings, who flourished from the opening of the third century to the middle of the seventh, during which period an academy of physic was founded at Gandisapor, a city of Korasan, and as it gradually declined from its original institution, it became a school of poetry, rhetoric, dialectics, and the abstract sciences. In this excellent seminary the Persian tongue must have been much refined, and the rusticity of the old idiom was succeeded by a pure and elegant dialect, which being constantly spoken at the court of Beharam Gúr in the year 331, acquired the name of "Deri," or courtly, to distinguish it from the "Pehlavi" or "Pahlavi," or language of the country. (See PERSIA.) This polished idiom did not, however, supersede the ancient dialect; for several compositions in Pahlavi were extant even after Mahomet, which appear to have been written by order of the Sassanian princes. Anushirvan, surnamed "the just," who reigned at the close of the 6th century, when Mahomet was born, obtained from India a collection of fables, translated by his chief physician from the Sanscrit language, which he acquired for this purpose; this collection he translated into the Pehlavian dialect; about 140 years after, it was turned from Pehlavi into Arabic, by order of Almanfor, second caliph of the Abbassides; and this is the volume now found in every language of Europe, under the name of "Calila wa Demna," or "the fables of Pilpay." A fine copy of the Arabic version is deposited in the public library at Oxford; and if the work of Barzuick, the above-mentioned physician, could be found, we might thus recover a considerable part of the old Persian language; the same, perhaps, which was spoken in the "second period" by Themistocles and Xenophon. In the reign of Anashirvan, Mahomet polished the language of his country; and when the battle of Cadessia gave the last blow to the Persian monarchy, the whole empire of Iran was soon reduced under the power of the first Mahometan dynasty; and the ancient literature of Persia, which had been promoted by the family of Sassan, was immediately discouraged by the successors of Mahomet; because some Persian romances, brought into Arabia, were extolled to the disparagement of the Koran, the people to whom they were read alleging, that "the stories of griffons and giants were more amusing to them than the moral lessons of Mahomet." Accordingly a chapter of the Koran was immediately written to stop the progress of these opinions, and other measures were taken to check their diffusion. This is supposed to have been the moving cause of that enthusiasm of the Mahometans, which induced them to burn the famous library of Alexandria, and the records of the Persian empire. It was a long time before the native Persians could recover from the shock of this violent revolution; and their language seems to have been little cultivated under the caliphs, who gave greater encouragement to the literature of the Arabians; but when the power of the Abbassides began to decline, and a number of independent princes arose in the different provinces of their empire, the arts of elegance, and chiefly poetry, revived in Persia; and there was hardly a prince, or governor of a city, who had not several poets and men of letters in his train. The Persian tongue was consequently restored in the 10th century; but it was very different from the Deri or Pehlavi of the ancients; it was mixed with the words of the Koran, and with expressions from the Arabian poets, whom the Persians considered as their masters, and affected to imitate in their poetical measures, and the turn of their verses. The oldest Persian

PERSIAN LANGUAGE.

Persian poems, of which sir W. Jones obtained any knowledge, are those of Ferdúsi, and which, in his account of them, are represented to be a glorious monument of eastern genius and learning; and of which he further says, that if it should be generally understood in its original language, will contest the merit of invention with Homer himself, whatever be thought of its subject, or the arrangement of its incidents. He has furnished an extract from this poem, and adds, that it will exhibit a specimen of the Persian tongue, very little adulterated by a mixture with the Arabic, and in all probability, approaching nearly to the dialect used in Persia in the time of Mahomet, who admired it for its extreme softness, and was heard to say, "that it would be spoken on that account in the gardens of Paradise." Of these two languages was formed the modern dialect of Persia, which, being spoken in its greatest purity by the natives of Pars or Farfistan, acquired the name of "Parfi;" though it is even called "Deri" by Hafiz. Nearly in the same age, *viz.* at the close of the 10th and beginning of the 11th centuries, the great Aleul Ola, surnamed Alámi from his blindness, published his excellent odes in Arabic, in which he professedly imitated the poets before Mahomet. At this time, and soon after, the Persian language became altogether mixed with Arabic. At Shiraz, called "the Athens of Persia," flourished in the 13th century Sadi, a native of this city; who wrote several pieces, both in prose and verse; and by means of an extract from his "Gulistan," or bed of roses, sir W. Jones has shewn us how the Persian and Arabic languages were mixed together in his age. The same city had the honour of producing, in the 14th century, the most elegant lyric poet of Asia, Shemseddin, surnamed "Hafiz;" of whose productions sir W. Jones has transcribed two Gazals or anacreontic odes, with a translation. There is nothing, says our much respected author, which affords a stronger proof of the excellence of the Persian tongue than that it remained uncorrupted after the irruption of the Tartars, who, at different times, and under various leaders, made themselves masters of Persia; for the Tartarian princes, and chiefly Tamerlane, who was a patron of Hafiz, were so far from discouraging polite literature, like the Goths and Huns, that they adopted even the language and religion of the conquered country, and promoted the fine arts with a boundless munificence; and one of them, who founded the Mogul empire in Hindoostan, introduced the Persian literature into his dominions, where it flourishes to this day; and all the letters from the Indian governors are written in the language of Sadi. The Turks themselves improved their harsh dialect by mixing it with the Persian; and Mahomet II., who took Constantinople in the middle of the 15th century, was a protector of the Persian poets, among whom was Nouredin Jami, whose poem "On the Loves of Joseph and Zelikha" is very highly extolled by our author, who has given a specimen of his elegant style. In the 16th and 17th centuries, under the family of Sefi, the Persian language began to lose its ancient purity, and even to borrow some of its terms from the Turkish, which was commonly spoken at court.

The Persian characters are written from the right hand to the left, and the language consists of 32 letters, which vary in their form as they are initials and medials, or finals, both connected and unconnected. For the pronunciation both of the consonants and vowels, we refer to sir William Jones's Grammar, from which we make the following extracts.

The short vowels are seldom written in the Persian books, and the omission of them occasions a perplexity to the learner of the language.

He will soon perceive with pleasure a great resemblance

between the Persian and English languages, in the facility and simplicity of their form and construction. The former, as well as the latter, has no difference of termination to mark the gender, either in substantives or adjectives: all inanimate things are neuter, and animals of different sexes either have different names, or are distinguished by certain words, denoting male and female.

The Persian substantives, like ours, have but one variation of case, which is formed by adding a certain syllable to the nominative in both numbers; and answers often to the dative, but generally to the accusative case in other languages. When the accusative is used indefinitely, this syllable is omitted; but when the noun is definite or limited, that syllable is added to it. In Persian there is no genitive case; but when two substantives of different meanings come together, a *hesra*, or short *e*, is added in reading to the former of them, and the latter remains unaltered. The same rule must be observed before a pronoun possessive, and before an adjective. The other cases are expressed, for the most part, as in our language, by particles placed before the nominative.

Our article *a* is supplied in Persian by adding the letter *ya*, or as it is sounded *ee*, to a noun, which restrains it to the singular number.

The Persian plural is formed by adding certain characters for syllables to the singular: but these terminations are not, as in many languages, wholly arbitrary; on the contrary, they are regulated with the utmost precision. It must not be omitted, that the Arabic substantives frequently have two sorts of plurals: one formed according to the analogy of the Persian nouns, and another after the irregular manner of the Arabians; and this circumstance, besides several others, proves the impossibility of learning the Persian language accurately, without a moderate knowledge of the Arabic: and sir William Jones advises the learner to peruse with attention the Arabic grammar of Erpenius, of which there are two fine editions, one by Golius, and another by Albert Schultens, before he attempts to translate a Persian manuscript.

The Persian adjectives admit of no variation, but in the degrees of comparison. The positive is made comparative by adding to it one character for a syllable, and superlative by means of another. An adjective is sometimes used substantively, and forms its plural like a noun: if it be a compounded adjective, the syllables denoting the plural number and the oblique case are placed at the end of it.

The personal pronouns are, 1. *men*, I: thus, sing. *men*, I; plur. *ma*, we; obl. *merá*, me, *mára*, us. 2. *To*, thou: thus, sing. *to*, thou; plur. *shumá*, you or ye; obl. *tura*, thee; *shumará*, you. 3. *O*, he: thus, sing. *o*, he, she, or it; plur. *ishán*, they; obl. *óra*, him, her, or it; *ishánra*, them. The possessives are the same with the personals, and are distinguished by being added to their substantives. Our reciprocal pronouns, *own* and *self*, are expressed in Persian by certain words, which are applicable to all persons and sexes. For the demonstrative pronouns, *this*, *these*, *that*, *those*, in the several cases singular, plural, and oblique, there are appropriate characters or expressions. Certain syllables prefixed to pronouns personal change them into possessives, and are read with a short vowel. The relatives and interrogatives are supplied by the invariable pronouns *ke* and *che*; of which the former usually relates to persons, and the latter to things.

The Persians have active and neuter verbs, like other nations; but many of their verbs have both an active and neuter sense, which can be determined only by the construction. These verbs have properly but one conjugation, and but

three changes of tense, the imperative, the aorist, and the preterite; all the other tenses being formed by the help of certain particles, or of the auxiliary verbs signifying *to be*, and *to be willing*. The passive voice is formed by adding the tenses of the verb substantive to the participle preterite of the active.

Our author has exhibited the inflections of the auxiliary verbs, and an analysis of all the tenses of a Persian verb, shewing in what manner they are deduced from the infinitive, which is properly considered by the oriental grammarians as the spring and fountain of all the moods and tenses, and which, therefore, in Arabic is called the "masdar," or the source. The Persians are very fond of the participle preterite; and it is very often used by their elegant writers to connect the members of a sentence, and to suspend the sense till the close of a long period. In poetry it sometimes is used like the third person preterite of a verb. Our author has subjoined a table of the moods and tenses, as they answer to those of European languages.

In the ancient language of Persia, there were very few or no irregularities: the imperative, which is often irregular in the modern Persian, was anciently formed from the infinitive, by rejecting the termination *eden*; for originally all infinitives ended in *den*, till the Arabs introduced their harsh consonants before that syllable, which obliged the Persians, who always affected a sweetness of pronunciation, to change the old termination of some verbs into *ten*, and by degrees the original infinitives grew quite obsolete; yet they still retain the ancient imperatives, and the aorists which are formed from them. This little irregularity is the only anomalous part of the Persian language, which, nevertheless, far surpasses in simplicity all other languages, as sir William Jones says, ancient or modern, of which he has any knowledge.

One of the chief beauties of the Persian language is the frequent use of compound adjectives; in the variety and elegance of which it surpasses not only the German and English, but even the Greek. These compounds may be multiplied without end, according to the pleasure and taste of the writer: they are formed either by a noun and the contracted participle, as in the word signifying "heart-alluring;" or by prefixing an adjective to a noun, as in that for "sweet-smelling;" or by placing one substantive before another, as in the word denoting "rose-cheeked." If we consider the vast number of epithets that may be compounded after these three forms, and that these epithets are often used for substantives, without a noun being expressed, we must allow that the Persian language is the richest in the world. These compounds are thought so beautiful by the Persian poets, that they sometimes fill a distich with them.

The construction of the Persian tongue is very easy, and may be reduced to a few rules, most of which it has in common with other languages. The nominative is usually placed before the verb, with which it agrees in number and person. It is remarked, however, that many Arabic plurals are considered in Persian as nouns of the singular number, and agree as such with verbs and adjectives. Another irregularity in the Persian syntax is, that the cardinal numbers are usually joined to nouns and verbs in the singular. The adjective is placed after its substantive, and the governing noun is prefixed to that which it governs. Conjunctions which express conjecture, condition, will, motive, &c. require the conjunctive or potential mood. Prepositions and interjections are fixed to nouns in the nominative case.

The modern Persians borrowed their poetical measures from the Arabs, and they are very various and complicated. There are nineteen sorts of metre, which are used by the Persians; but the most common of them are the iambic

measure, or the trochaic measure, and a metre that consists chiefly of those compounded feet, which the ancients called *Επιπέδες*; and which are composed of iambic feet and spondees alternately, as *āmātōrēs pūllārūm*. In lyric poetry, these verses are generally of twelve or sixteen syllables; but they sometimes consist of fourteen syllables. Other lyric verses contain thirteen syllables. The Persians sometimes use a measure consisting of trochees and spondees alternately; but the most common Persian verse contains eleven syllables, in which measure are written all the great Persian poems, whether upon heroic or moral subjects, as the works of Ferdūsi, and of Jāmi, the Bostan of Sadi, and the Mesnavi of the excellent Gelāleddin. This sort of verse answers to our common heroic rhyme. The profody of the Persians is extremely easy and simple: their vowels called *clif*, *vau*, and *ya*, are long by nature; the points, which they commonly suppress, are naturally short; and every short syllable that ends with a consonant is long by position. But the Persians, like other poets, have many licences; they often add a short vowel, which does not properly belong to the word; they also shorten some long syllables at pleasure, by omitting the vowels *clif*, *vau*, and *ya*. We shall here add, the verses of eleven syllables, which are used in the great Persian poems, always rhyme together in couplets.

The Persian elegy differs only in its length from the ode, except that the "cassideh" often turns upon lofty subjects, and the "gazel" comprises for the most part the praises of love and merriment, like the lighter odes of Horace and Anacreon. The most elegant composers of these odes are Jāmi and Hafiz, each of whom has left an ample collection of his lyric poems. Sir William Jones, among other numerous translations, has given us a translation in verse of a beautiful Persian song by Hafiz. If this article had not already been so extended, we should have felt disposed to gratify our readers with a transcript of it; but we must content ourselves with referring to the close of sir William Jones's Persian Grammar, or to his Works, vol. v.

PERSIAN Lily, in *Gardening*, the common name of a plant of the flower kind. See FRITILLARIA.

PERSIAN Wheel, in *Agriculture*, is a machine for raising a quantity of water sufficient to overflow lands bordering on the banks of rivers, &c. where the stream is too low to do it alone.

Such a wheel is represented in *Plate XIV. Hydraulics and Hydrostatics, fig. 3*, with which water may be raised by means of a stream A B turning a wheel C D E, according to the order of the letters, with buckets, *a, a, a, a*, &c. hung upon the wheel by strong pins *b, b, b, b*, &c. fixed in the side of the rim: but the wheel must be made as high as the water is intended to be raised above the level of that part of the stream in which the wheel is placed. As the wheel turns, the buckets on the right hand go down into the water, and are thereby filled, and go up full on the left hand, until they come to the top at K; where they strike against the end, *n*, of the fixed trough M, and are thereby overset, and empty the water into the trough; from which it may be conveyed in pipes to the place which it is designed for: and as each bucket gets over the trough, it falls into a perpendicular position again, and goes down empty, until it comes to the water at A, where it is filled as before. On each bucket is a spring *r*, which going over the top or crown of the bar *m* (fixed to the trough M) raises the bottom of the bucket above the level of its mouth, and so causes it to empty all its water into the trough.

Sometimes this wheel is made to raise water no higher than its axis; and then instead of buckets hung upon it, its spokes C, *d, e, f, g, h*, are made of a bent form, and hollow within;

within; these hollows opening into the holes C, D, E, F, in the outside of the wheel, and also into those at O in the box N upon the axis. So that, as the holes C, D, &c. dip into the water, it runs into them; and as the wheel turns, the water rises in the hollow spokes *c, d*, &c. and runs out in a stream, P, from the holes at O, and falls into the trough O, from whence it is conveyed by pipes. And this is a very easy way of raising water, because the engine requires neither men nor horses to turn it. See *OVERFLOWING of Land*.

PERSIAN, or *Perfic*, in *Architecture*, a name common to all statues of men, serving instead of columns, to support entablatures. See *ORDER*.

They only differ from caryatides, in that those represent statues of women.

The Persian is a kind of order of columns, first practised among the Athenians, on occasion of a victory their general Pausanias obtained over the Persians. As a trophy of this victory, the figures of men dressed in the Persian mode, with their hands bound before them, and other characters of slavery, were charged with the weight of Doric entablatures, and made to do the office of Doric columns.

Persian columns, M. le Clerc observes, are not always made with the marks of slavery; but are frequently used as symbols of virtues, vices, joy, strength, valour, &c. as when made in the figures of Hercules, to represent strength; and of Mars, Mercury, fauns, satyrs, &c. on other occasions.

PERSIAN Era, and *Year*. See *EPOCHA* and *YEAR*.

PERSIAN Bibles, and *Coins*. See the substantives.

PERSICA, in *Botany*, the *Malus Persica*, or Persian Apple, of the ancients, our Peach. See *AMYGDALUS*.

PERSICA Concha, in *Natural History*, a name given to a very remarkable and beautiful sea-shell, which authors have long been at a loss to reduce to any genus.

Aldrovand has thrown it to the end of his work, and says, it would be of the turbinated kind, if it did not want the turba. It is truly of the genus of the concha globosa, or dolium.

PERSICA Terra, an earth of the ochre kind, known in the colour shops of London by the name of *Indian red*.

It is a very fine purple ochre, of a considerably compact texture, and great weight; while in the earth it is of a pure blood-colour, and is not to be cut with the spade, but is dug with iron crows, and falls in irregular masses. It is of a rough dusty surface, and full of considerably large, bright, glittering particles: these are white and of a fine lustre. It adheres firmly to the tongue, is rough and harsh to the touch, stains the hands very deeply, and is of a rough astringent taste, and makes a very violent effervescence with acid menstruums.

It is dug in the island of Ormus, in the Persian gulf, and in some parts of the East Indies.

PERSICARIA, in *Botany*, so called by the old writers, from the likeness of its leaves to those of the peach-tree. (See *POLYGONUM*.) The word is now become the popular English appellation of a very fine species, *Polygonum orientale*, whose leaves however bear no resemblance to the peach, nor to those of the original *Persicaria*.

PERSIUS, **AULUS PERSIUS FLACCUS**, in *Biography*, a celebrated Roman poet, is said to have been born at Volterra, in Tuscany, in the year 34 of the Christian era. He was educated according to his rank, being of an equestrian family. He studied at Rome, and as he grew up he lived in intimacy with several of the most eminent persons of his time, and was generally beloved for the modesty of his disposition, and the suavity of his manners. He died at the

early age of 28, and bequeathed to his preceptor his library of 700 volumes, with a considerable sum of money, but the philosopher accepted only the library, and divided the money among Persius's sisters. As a poet, Persius is only known by his six Satires, which were in high reputation among his countrymen. They are of a grave sententious kind, chiefly turning upon topics of general morals. The philosophy of his preceptor Cornutus, to whom one of them is dedicated, has given them an elevation and purity of sentiment, which in some parts places them in the first rank of moral poetry; but their extreme obscurity almost destroys the pleasure of a perusal. The satires of Persius are generally printed with those of Juvenal. The best editions are those of Isaac Casaubon, in 1605, Paris, and in 1647, London.

PERSO, in *Geography*, a town of Italy, in the country of Friuli; 10 miles N.W. of Udina.

PERSOLATA, in *Botany*, a word used by Pliny, as the name of a kind of burdock, different from the *personata*. He has, in the beginning of the chapter, spoken of the *artemium* of the Greeks, which he says the Latins sometimes called *personata*, and afterwards adds this *persolata*; which, he says, was a plant vulgarly known, and called by the Greeks *artemium*.

He seems to allow, that the Greeks called both these plants by the same name; but he distinguishes the *persolata* from *personata*, by saying that the former has leaves like those of the great gourd, but larger and more hairy. It is probable, therefore, that he distinguishes, under these two names, the two different species of the great burdock common with us, the one with simple, the other with woolly heads.

PERSON, **PERSONA**, an individual substance of a rational or intelligent nature.

The father and son are reputed in law as the same person; an ambassador represents the person of his prince.

The word person, *persona*, is said to be borrowed *personando*, from personating or counterfeiting; and is supposed to have first signified a mask: by reason, says Boethius, in *larva concava sonus volvatur*: and hence the actors who appeared masked on the stage, were sometimes called *larvati*, and sometimes *personati*.

The same author adds, that as the several actors represented each their single individual person, *viz.* Oedipus, or Chremes, or Hecuba, or Medea; for this reason, other people, who were also distinguished by something in their form, character, &c. whereby they might be known, came also to be called, by the Latins, *personæ*; and, by the Greeks, *προσωπα*.

Again, as these actors rarely represented any but great and illustrious characters, the word came, at length, to import the mind; as being a thing of the greatest regard and dignity among human matters. And thus men, angels, and even God himself, were called *persons*. Things merely corporeal, as a stone, a plant, or a horse, were called by them, *hypostasēs*, or *supposita*, but never *persons*.

Hence also the learned imagine, the same name person came to be used to signify some dignity, whereby a person is distinguished from another; as a father, husband, judge, magistrate, &c.

In which sense we are to understand that of Cicero: Cæsar never speaks of Pompey but in terms of honour and respect; but he does many hard and injurious things against his person.

As for the name person. As for the thing, we have already defined person, an individual substance of a reasonable nature; which is the same as Boethius's definition.

Now a thing may be individual two ways. 1. Logically,

as it cannot be predicated of any other; as Cicero, Plato, &c. 2. Physically; in which sense a drop of water, separated from the ocean, may be called an individual. Person is an individual nature in each of these senses: logically, says Boethius, since person is not spoken of universals, but only of singulars and individuals; we do not say the person of an animal, or a man, but of Cicero and Plato: and physically, since Socrates's hand or foot are never considered as persons.

This last kind of individual is denominated two ways; positively, as when the person is said to be the whole principle of acting; for whatever thing action is attributed to, that do the philosophers call a person: and negatively, as when we say, with the Thomists, &c. that a person consists in this, that it does not exist in another as a more perfect being.

Thus, a man, though consisting of two very different things, *viz.* body and spirit, is not two persons; since neither part alone is a whole principle of action, but one person, since the manner of his consisting of body and spirit is such as constitutes one whole principle of action; nor does he exist in any other as a more perfect being; as, *e. g.* Socrates's foot does in Socrates, or a drop of water in the ocean.

PERSON, in *Grammar*, is a term applied to verbs and pronouns, which being conjugated, are applicable to three different persons.

I love, is a verb used in the first person; *thou lovest*, designs the second person; *he loveth*, makes the third: and thus in the plural number.

I, thou, he, are pronouns of the first, second, and third persons.

Verbs agree with their nouns, in number and person.

PERSON, *Persona*, in *Dramatic Poetry*, the name and part of an actor; or of him presented by the comedian.

At the head of dramatic pieces come the *dramatis personæ*, the list of actors, and characters that are to appear on the stage.

The ancient tragedy was only a simple chorus: Theſpis was the first who introduced a person to relieve the chorus; and Æschylus added a second.

F. Bosſu observes, that, in the epic and dramatic poem, the same person must reign throughout; *i. e.* must sustain the chief part throughout the whole piece, and the characters of all the other persons must be subordinate to him.

PERSON, *Persona*, in *Law*. See PARSON.

PERSON, in *Geography*, a county of America, in Hillsborough district, North Carolina; containing 6402 inhabitants, of whom 2082 are slaves.

PERSONA *nec prebendarii*, *Quod*, &c. See QUOD.

PERSONABLE, *PERSONABILIS*, in *Law*, implies the being able to hold or maintain a plea in court.

That is, as the civilians would express it, *habere personam standi in judicio*.

Thus they say the defendant was judged personable to maintain this action. Old Nat. Brev. 142.

The tenant pleaded, that the demandant was an alien, born in Portugal, without the ligeance of the king; and judgment was asked, Whether he should be answered? The plaintiff said, he was made personable by parliament. Kitch. fol. 124.

PERSONABLE is also used to signify a capacity to take any thing granted or given.

PERSONAL, something that concerns, or is restrained to, the person.

In disputes among the learned, there is ever something personal intermixed; in ethics, it is a maxim, that all

faults are personal; *i. e.* they do not pass to our descendants.

PERSONAL *Action*, in *Law*. See ACTION.

PERSONAL *Goods*, or *Estate*, is that consisting of money, moveables, &c. which every person has in his own disposal (see CHATTELS), in opposition to lands and tenements, which are called *real estate*.

PERSONAL *chattels*, *covenant*, *distress*, *history*, *liberty*, *patronage*, *privilege*, *service*, and *tithes*. See the substantives.

PERSONAL *Pronoun*, or *verb Personal*, in *Grammar*, a verb or pronoun conjugated in all the three persons.

They are thus called, in opposition to *impersonals*, which have only the third person.

PERSONALITY, *PERSONALITAS*, in the schools, the quality of a person; or that which constitutes an individual in the quality of a person.

The philosophers being used to consider matter and form in every other thing, do the same in person. The matter of person, according to them, is a singular substance, endowed with reason: for substance may, at the pleasure of God, either be, or not be, a person; inasmuch as, they say, the human nature in Christ is not a person. The form of person, which they call *subsistency*, *suppositality*, and *personality*, is that by which the aforesaid substance becomes individual.

The school divines are divided about what it is that distinguishes the several personalities in the Trinity. Some will have it to be only the different relations: others, as Floraventius, contend for some incommunicable substance: St. Bonaventure, and St. Thomas, take it to be different origins that distinguish the personalities; which opinion is the most followed. See TRINITY.

PERSONALITY, or *Personalty*, in *Law*. An action is said to be in personality, when it is brought against the right person.

PERSONATA COROLLA, in *Botany*, is a monopetalous irregular corolla, whose mouth is closed by a kind of palate, as in *Antirrhinum*. The term is derived from *persona*, a mask, and its application in the present instance, whether intended or not by Linnæus, is peculiarly happy; the plants furnished with such a corolla being, as it were, of the regular pentandrous tribe, under a mask, which they occasionally lay aside. See PELORIA and PERSONATÆ.

PERSONATÆ, the fortieth natural order among the *fragmenta* of Linnæus, nearly analogous to the *Scrophulariæ* and the *Vitices* of Jussieu, embracing moreover some that are subjoined to his *Solanææ*. This order is characterized by a monopetalous unequal corolla; stemens usually four, two of them longest, or sometimes only two in all; style solitary; and a fruit, generally superior, of two cells, with numerous seeds. Many of the plants are fœtid and poisonous, few of them aromatic, though the flowers of some are fragrant. They are all more or less naturally allied to the first order of the Linnæan class *Pentandria*, but they arrange themselves either in the *Diandria Monogynia*, or rather, principally, in the *Didymania Angiospermia*, according to the laws of the artificial system. Some are shrubby in habit, but the greater part are herbaceous. The leaves are mostly simple; the inflorescence either axillary, corymbose, spiked or panicled. It is by an unaccountable error that Linnæus has marked *Melaleuca* as belonging to this natural order, in his *Manissa*, p. 14, that genus being evidently referrible to his nineteenth order, the *Hesperidææ*. Giseke, who points out this mistake, well observes, that there is no order in which so many genera bear the names of botanists as in this of the *Personatææ*.

PERSONIFYING, or PERSONALIZING, the feigning a person; or attributing a person to an inanimate being; or giving it the figure, sentiments, and language of a person. See PHOSOROPŒIA.

The poets have personified all the passions; and even made divinities of them, which were worshipped by the heathens; as the goddess Persuasion, the god Sleep, the Furies, Envy, and Discord, and Fame, Fortune, Victory, &c.

Personifying is essential to poetry, especially to the epœia.

PERSOONIA, in *Botany*, was so named by the writer of the present article, in honour of his highly deserving friend and correspondent, Christian Henry Perfoon, author of many valuable works on *Fungi*, in which department of Botany this author decidedly takes the lead. He has also edited a *Synopsis* of the vegetable kingdom, on the plan of the Linnæan *Sytema Vegetabilium*, but in a very small type, printed at Paris, where he now resides. Mr. Perfoon was, if we mistake not, born of Dutch parents, at the Cape of Good Hope. Two other genera have been ascribed to him, one by Willdenow in his *Sp. Pl.* v. 2. 331, which is the *Carapa* of Aublet, t. 387, and Lamarek t. 301; and another by Michaux, *Fl. Boreal-Amer.* v. 2. 104, of the class Syngenesia. These are both of a posterior date to the genus of which we are to treat, and which is now generally adopted. *Sm. Tr. of Linn. Soc.* v. 4. 215. *Mart. Mill. Dict.* v. 3. *Brown Tr. of Linn. Soc.* v. 10. 159. *Prodr. Nov. Holl.* v. 1. 371. *Ait. Hort. Kew.* v. 1. 203. *Gærtn.* v. 3. t. 220. (*Pentadactylon*; *ibid.* t. 220. *Br.* *Linkia*; *Cavan. Ic.* v. 4. 61.)—Class and order, *Tetrandria Monogynia*. *Nat. Ord. Proteaceæ*, *Juss.* *Brown.*

Gen. Ch. *Cal.* none, except a slight border. *Cor.* Petals four, equal, linear-oblong, recurved, deciduous. Nectary of four distinct glands, at the base of the germen. *Stam.* Filaments scarcely any; anthers four, inserted about the middle of each petal, linear, erect, prominent, at length reflexed. *Pist.* Germen superior, stalked, ovate; style thread-shaped, on a level with the anthers, permanent; stigma obtuse. *Peric.* Drupa ovate, pulpy. *Seed.* Nut of one or two cells.

Eff. Ch. Petals four, recurved, bearing the stamens about their middle. Nectary of four glands. Germen superior, stalked. Stigma obtuse. Drupa with a nut of one or two cells.

Obs. Mr. Brown remarks, that the stalk of the germen is jointed in some species, and that the cotyledons are, for the most part, more than two. The habit is shrubby or arboreseent; the bark sometimes flaky. Leaves scattered, entire, mostly flat. Flower-stalks axillary, solitary, without bractæas, or racemose, with a solitary bractæa. Flowers yellow. We follow Mr. Brown in the order and names of the twenty-two known species.

1. *P. teretifolia*.—"Leaves thread-shaped, without furrows. Stalks solitary, single-flowered. Anthers pointed. Style shorter than the germen."—Gathered by Mr. Brown, on stony hills, at Lewin's land, on the south coast of New Holland.

2. *P. microcarpa*.—"Leaves thread-shaped, channelled. Stalks solitary, in pairs, or ternate. Anthers pointless. Style longer than the germen. Stigma drooping."—Native of marshy heaths, in the same country.

3. *P. pinifolia*.—"Leaves thread-shaped, lax. Spike pyramidal, elongated, leafy. Floral leaves shorter than the rest. Germen single-seeded."—Found by Mr. Brown on

heaths, and about the banks of rivulets, at Port Jackson, New South Wales.

4. *P. juniperina*. *Labill. Nov. Holl.* v. 1. 33. t. 45.—Leaves awl-shaped, straight, pungent. Flowers axillary, solitary. Germen smooth, with two kernels. Found on dry heaths and about the sides of hills, in Van Diemen's land, as well as on the south coast of New Holland. The stem, according to Labillardiere, is a yard or more in height, determinately branched, round, and leafy. Leaves rigid, above an inch long, rather hairy, as are the short axillary flower-stalks. Petals clothed externally with rigid hairs, yellowish. Fruit red, eatable, its nut usually with two kernels.

5. *P. hirsuta*. *Perf. Syn.* v. 1. 118.—Leaves linear, revolute, hairy and rough. Flower-stalks axillary. Germen silky, single-seeded.—Native of moist heaths about Port Jackson, New South Wales. *Br.* The flowers are very hairy externally, and full as long as the leaves.

6. *P. mollis*.—"Leaves lanceolate, elongated, villous, very soft beneath. Corolla bearded. Germen smooth, with two kernels."—Gathered by Mr. Brown, near Port Jackson, about the sandy banks of rivers.

7. *P. linearis*. *Linear-leaved Persoonia*. *Ait. n. 1.* *Andr. Repof.* t. 77. *Curt. Mag.* t. 760. *Venten. Malmaif.* t. 32.—Leaves linear, elongated, smooth. Flower-stalks straight. Corolla downy. Stalk of the germen without a joint. Stem arboreous. Bark smooth.—On hills and in open fields about Port Jackson, from whence specimens and seeds were first sent by Dr. White in 1792. The plant was raised by the late Mr. Robinson of Stockwell, in 1794. It proved a hardy greenhouse shrub, flowering copiously in the latter part of summer. The young branches, as well as the flower-stalks, and backs of the petals, are downy. Leaves copious, spreading, two inches or more in length, and not a line wide. Fruit globose, smooth.

8. *P. lucida*.—"Leaves linear, somewhat lanceolate, elongated, smooth. Flower-stalks downy, straight. Corolla downy. Stalk of the germen without a joint. Stem arboreous. Bark flaky."—Found near Port Jackson, by the sides of mountain rivers, by Mr. Ferd. Bauer. It seems nearly related to the last.

9. *P. virgata*.—"Leaves linear, or somewhat oblong, scattered, vertical, very smooth in every part. Flower-stalks smooth, straight. Corolla smooth. Stem arboreous. Bark even."—Gathered by Mr. Brown, on the sea shore, near Sandy Cape, on the east coast of New Holland.

10. *P. flexifolia*.—"Leaves nearly linear, pointed, crowded, twisted at the base, smooth on both sides, besprinkled with shining dots; their edges rough. Corolla smooth. Stem shrubby."—Native of the stony sides of hills, on the south coast of New Holland.

11. *P. scabra*.—"Leaves linear-lanceolate, pointed, rough on both sides, besprinkled with shining as well as minute opaque dots. Corolla downy."—In the same country and situations as the last.

12. *P. spatulata*.—"Leaves lanceolate-spatulate, pointed, rather concave, very rough on both sides with crystalline points."—Gathered by Mr. Brown in the same places as the two last.

13. *P. nutans*.—"Leaves linear, smooth. Flower-stalks axillary, recurved, smooth as well as the corolla."—Found by Mr. Brown near Port Jackson, in woods on a sandy soil, at the foot of the mountains.

14. *P. falcata*.—"Leaves lanceolate, elongated, tapering at the base, somewhat stalked, falcate, revolved, coriaceous. Anthers pointed. Stem arboreous. Bark flaky."—Gathered

—Gathered by Sir Joseph Banks, near Endeavour river, on the east coast of New Holland; and by Mr. Brown, at Carpentaria, on the north coast, near the sea shore.

15. *P. lanceolata*. Lance-leaved Perfoonia. Ait. n. 2. Andr. Repof. t. 74.—Leaves elliptic-lanceolate, pointed, smooth and even. Stalks axillary, single-flowered. Corolla silky, with close-pressed hairs. Stalk of the germen without a joint.—Native of fields and heaths towards the sea coast at Port Jackson, from whence seeds were very early sent to this country. Plants are said to have been first raised in 1791, by J. Wilson, esq. at Islington. The leaves are about two inches long. Flowers yellow, as in all the rest. Fruit globose, the size of a black currant.

β. *P. latifolia*, Andr. Repof. t. 286, is proposed, not without hesitation, by Mr. Brown, as a variety of this. It differs in having larger and obovate leaves, which in our native specimens, sent from Port Jackson by Dr. White, appear somewhat glaucous. The flowers exactly agree. Still we should be inclined to consider this supposed variety as a distinct species, did we not rather confide in Mr. Brown's opinion, formed from observation of the wild plants.

16. *P. salicina*. Perf. Syn. v. 1. 118. (*Linkia lævis*; Cavan. Ic. v. 4. 61. t. 389.)—Leaves lanceolate-oblong, unequal, reversed. Stalks axillary or racemose. Corolla nearly smooth. Stem arboreous. Bark flaky.—Native of fields, hills, and woods, in the neighbourhood of Port Jackson. The leaves are three inches long, their sides more or less unequal, giving them a falcate aspect. Flower-stalks and young branches silky. Corolla nearly smooth. Fruit elliptical; its nut with two kernels.—Mr. Brown suspects that Cavanilles's plant may rather be a variety of the last; but it seems to us to agree best with the present species, though his plate does not express any inequality in the shape of the leaves. We have a specimen with obovate leaves, that seems a variety of *salicina*.

17. *P. ferruginea*. Sm. Exot. Bot. v. 2. 47. t. 83. (*P. laurina*; Perf. Syn. v. 1. 118. *Br.*)—Leaves elliptical, acute, veiny. Stalks axillary, many-flowered, clothed, as well as the backs of the petals, with rusty silky hairs.—Native of fields near Port Jackson, from whence it was originally sent dried by Dr. White. We have not heard of this beautiful species in any garden. The stem is shrubby, three or four feet high, with smooth branches. Leaves for the most part nearly opposite, two or three inches long, and about one broad, smooth, shining, veiny. Flowers in short, dense, axillary clusters, accompanied by small bractees, which, as well as stalks, and the backs as well as margins of the petals, are densely clothed with shining silky hairs of a deep rusty orange-colour. The germen is covered with similar hairs, but the style is smooth.—This shrub flowers in its native country in November.

18. *P. prostrata*—"Leaves oval, obtuse, downy at the margin. Stalks axillary, with one or more flowers. Stem procumbent."—Gathered by Mr. Brown in fruit, the flowers being all past, near Sandy Cape, on the east coast of New Holland, growing in sand near the sea shore.

19. *P. elliptica*—"Leaves elliptical, veiny. Clusters lateral. Petals smooth. Stalk of the germen jointed."—Gathered by Mr. Brown on the stony sides of hills at Lewin's Land, on the south coast of New Holland.

20. *P. articulata*—"Leaves lanceolate, elongated, equal, smooth. Stalks axillary, with one or more flowers. Corolla nearly smooth. Lower joint of the stalk of the germen as long as the glands."—Gathered by Mr. Brown in Lewin's Land, with the foregoing.

21. *P. longifolia*—"Leaves linear, elongated, falcate. Stalks axillary, with one or more flowers. Corolla downy,

with close-pressed hairs. Lower joint of the stalk of the germen longer than the glands."—From the same country.

22. *P. graminea*—"Leaves of the branches linear, very long, revolute. Clusters many-flowered, turned one way. Corolla smooth. Stem short, somewhat shrubby."—Found by Mr. Brown, about the sandy margins of standing pools, in Lewin's Land.

PERSPECTIVE is the art of representing objects on a definite surface, so as to affect the eye when seen from a certain position, in the same manner as the object itself would, when the eye is fixed in the point in view.

We shall introduce this article with a brief history of the rise and progress of perspective, and close it with an enumeration of the principal writers on the theory and practice of the art.

The art of perspective owes its birth to painting, and particularly to that branch of it which was employed in the decorations of the theatre, where landscapes were principally introduced, and which would have looked unnatural and horrid, if the size of the objects had not been pretty nearly proportioned to their distance from the eye. The ancients must, therefore, have had considerable knowledge of this art; though the only ancient author from whom we can obtain any information relative to its antiquity, is Vitruvius; who, in the preface to his seventh book, informs us, that Agatharcus, at Athens, was the first who wrote on this subject, on occasion of a play exhibited by Æschylus, for which he prepared a tragic scene; and that afterwards the principles of the art were more distinctly taught in the writings of Democritus and Anaxagoras, the disciples of Agatharcus, which are no longer extant.

The perspective of Euclid and of Heliodorus Larissens contains only some general elements of optics, that are by no means adapted to any particular practice; though they furnish some materials that might be of service even in the linear perspective of painters.

Geminus of Rhodes, who was a celebrated mathematician in the time of Cicero, hath likewise written on this subject.

We may also infer, that the Roman artists were acquainted with the rules of perspective, from the account which Pliny, (*Nat. Hist. lib. xxxv. cap. 4.*) gives of the representations on the scene of those plays given by Claudius Pulcher; by whose appearance, he says, the crowds were so deceived, that they endeavoured to settle on the fictitious roofs. However, of the theory of this art among the ancients we know nothing; as none of their writings have escaped the general wreck of ancient literature in the dark ages of Europe. Perspective must, without doubt, have been lost, when painting and sculpture no longer existed. Nevertheless, we have reason to believe, that it was practised much later in the eastern empire.

John Tzetzes, who lived in the twelfth century, speaks of it as if he was well acquainted with its importance in painting and statuary: and the Greek painters, who were employed by the Venetians and Florentines, in the thirteenth century, seem to have brought some optical knowledge with them into Italy: for the disciples of Giotto are commended for observing perspective more regularly than any of their predecessors in the art had done; and they lived in the beginning of the fourteenth century.

The Arabians were not ignorant of this art; as we may presume from the optical writings of Alhazen, who lived about the year 1100, cited by Roger Bacon, when treating on this subject.

Vitellus, a Polander, about the year 1270, wrote largely and learnedly on optics.

Our own friar Bacon, as well as John Peckham, archbishop of Canterbury, treated this subject with surprising accuracy, considering the times in which they lived.

The most ancient authors, who professedly laid down rules of perspective, were Bartolomeo Bramantino, of Milan, whose book, entitled "Regole di Perspectiva, e Misure delle Antichità di Lombardia," is dated 1440; and Pietro del Borgo, likewise an Italian, who was the most ancient author met with by Ignatius Danti, and who is supposed to have died in 1443. The last writer supposed objects to be placed beyond a transparent tablet, and endeavoured to trace the images, which rays of light, emitted from them, would make upon it. But his work is not now extant. However, Albert Durer constructed a machine upon the principles of Borgo, by which he could trace the perspective appearance of objects.

Leon Battista Alberti, in 1450, wrote his treatise "De Pictura," in which he treats principally of perspective.

Balthazar Peruzzi, of Sienna, who died in 1536, had diligently studied the writings of Borgo; and his method of perspective was published by Serlio in 1540. To him, it is said, we owe the discovery of points of distance, to which all lines that make an angle of 45° with the ground line are drawn.

Guido Ubaldi, another Italian, soon after discovered, that all the lines that are parallel to one another, if they be inclined to the ground line, converge to some point in the horizontal line; and that through this point, also, a line, drawn from the eye, parallel to them, will pass.

His perspective was printed at Pefaro in 1600, and contained the first principles of the method afterwards discovered by Dr. B. Taylor.

In 1583, there was published a book, written by Giacomo Barozzi, of Vignola, commonly called Vignola, intitled "The two Rules of Perspective, with a learned Comment," by Ignatius Danti. In 1615, the work of Marolois was printed, in Latin, at the Hague, and engraved and published by Hondius. And in 1625, Sirigatti published a treatise of perspective, which is little more than an abstract of Vignola's.

The art of perspective has been gradually improved by subsequent geometricians, particularly by professor Gravelande, and, in a much greater degree, by Dr. Brook Taylor, whose principles are in a considerable measure new, and far more general than those of any of his predecessors. He did not confine his rules, as his predecessors had done, to the horizontal plane only, but made them general, so as to affect every species of planes and lines, whether they were parallel to the horizon or not; and thus the principles were made universal. Farther, from the simplicity of his rules, the whole tedious progress of drawing out plans and elevations for any object is rendered entirely useless, and therefore avoided: for by this method, not only the fewest lines imaginable are required to produce any perspective representation, but every figure, thus drawn, will bear the nicest mathematical examination. Moreover, his system is the only one calculated for answering every end of those who are practitioners in the art of design; because from hence they may be enabled to produce the whole, or only so much of an object as is wanted, and by fixing it in its proper place, may determine its apparent magnitude in an instant. It explains also the perspective of shadows, the reflections of objects from polished planes, and the inverse practice of perspective.

His "Linear Perspective" was first published in 1715; and his "New Principles of Linear Perspective" in 1719, which he intended as an explanation of his first treatise. In 1738,

Mr. Hamilton published his *Stereography*, in 2 vols. folio, after the manner of Dr. Taylor. But the most complete system of perspective, both as to theory and practice, on the same principles, is that of Mr. Malton, the second edition of which was published in 1779, fol. We have also treatises on this subject, by the Jesuit, originally written in French, at Paris, translated by Mr. Chambers, and printed at London, in 1726, Highmore, Ware, Cowley, Kirby, Priestley, Ferguson, &c.

The instruments necessary for drawing according to the rules of perspective, are a tee square, a parallel ruler, a drawing board (which is only a smooth board made exactly square), a sector, a protractor; to which may be added a drawing-pen, and a black-lead pencil.

Proposition.—It is a well-known fact, founded on experience, that objects reflect their lights, shades, and colours in straight lines, and describe an image in the eye which produces that sensation of the object called *vision*; which see.

Corol. 1.—If a straight line be opposed to the eye, and not directed to it, the rays or straight lines which issue from all points of it to the eye, form a plane.

Corol. 2.—If any plane or solid be opposed to the eye, the straight lines or rays which issue from all points of the surface to the eye form a pyramid, provided that with respect to the plane the eye is out of its surface. The following are definitions of the terms employed.

1. The straight line reflected from any point of a line or surface, is called a visual ray.

2. A plane composed of visual rays is called an optic plane. See PLANE,

3. A pyramid composed of visual rays is called an optic pyramid.

4. An optic plane or pyramid is called a system of rays.

5. If a system of rays be intercepted by a plane, the common section is called the scenographic or perspective representation of the body.

Corol.—Hence the representation of any right line, or rectilinear figure, or solid, is also rectilinear.

6. The plane on which the section is made is called the picture.

7. The point, line, surface, or body, from which the rays proceed to the eye, is called the original object.

Corol. 1.—Hence, if the original object be a plane, and the picture parallel to it, the representation will be a figure similar to the original.

Corol. 2.—If any part of an original object touch the picture, the part which is thus in contact will be the scenographic representation of that part.

8. The vertex or point of the pyramid where the eye is placed, is called the point of sight, or point of view.

9. If the original object be situated on a plane, this plane is called the original or primitive plane.

10. If a plane be supposed to pass through the eye parallel to the picture, this plane is called the directing plane.

11. The intersection of the picture and the original plane is called the intersection or intersecting line of that plane.

12. The intersection of any original line with the picture, is called the intersecting point of that original line.

Corol.—Hence the intersecting points of all lines in any original plane, are in the intersecting line of that plane.

13. If a straight line be supposed to be drawn through the

PERSPECTIVE.

the eye parallel to any original line, the line so drawn is called the parallel of that original plane.

Corol.—Hence, if any number of original lines be parallel among themselves, one line can only pass through the eye parallel to them all.

14. If a plane be supposed to pass through the eye parallel to any original plane, or the plane of an original object, the plane thus passing through the eye is called the parallel of that original plane.

Corol.—Hence, if any number of original planes be parallel among themselves, one plane only can pass through the eye, which will be parallel to them all.

15. The intersection of the parallel of any original plane and the picture, is called the vanishing line of that plane.

Corol. 1.—Hence the intersecting and vanishing lines are parallel to each other.

Corol. 2.—Hence all original parallel lines have the same vanishing line.

Corol. 3.—Hence the parallels of every two original planes have the same inclinations as the originals.

Corol. 4.—The vanishing point of the common intersection of any two planes, is the intersection of the vanishing lines of these planes.

16. The intersection of the parallel of any original line is called the vanishing point of the original line.

Corol. 1.—The vanishing points of all lines in the same original plane, are in the vanishing line of that plane.

Corol. 2.—Hence any number of original parallel lines can have only one vanishing point.

Corol. 3.—Hence original lines which are parallel to the picture have no vanishing point, because their parallels can never cut it.

Corol. 4.—The lines which generate the vanishing points of two original lines, make the same angle with the eye as the originals do with each other.

17. The intersection of the original plane and the directing plane, is called the directing line of that plane.

18. The intersection of any original line with the directing plane is called the directing point of that original line.

Corol.—Hence the directing points of all lines in the same original plane are in the directing line of that plane.

19. A straight line drawn from the directing point of any original line to the eye is called the director of that original line.

20. The intersection of the vanishing plane and the directing plane is called the parallel director, or parallel of the eye.

Corol.—Hence the intersecting line, the vanishing line, the parallel director, and directing line, are all parallel to each other.

21. If a straight line be drawn from the point of sight perpendicular to the picture, the point where it meets the picture is called the centre of the picture; and the part of the line intercepted between the point of sight and the centre of the picture is called, the distance of the picture, or principal distance.

22. If a straight line be drawn from the point of sight perpendicular to a vanishing line, the point where it meets the vanishing line is called the centre of that vanishing line; and the part intercepted between the point of sight and the centre of the vanishing line, is called the distance of that vanishing line.

Corol. 1.—Hence a line drawn from the centre of the picture to the centre of a vanishing line, is perpendicular to that vanishing line.

Corol. 2.—The distance of a vanishing line is the hypotenuse of a right-angled triangle, the base of which is the distance of the picture, and the perpendicular the distance between the centre of the picture and the centre of its vanishing line.

23. If the distance on a vanishing line from the vanishing point to another point, be equal to the distance of that vanishing point from the eye, the other extremity of this distance, which is not the vanishing point, is called the point of distance.

24. The point where a perpendicular drawn from the centre of the vanishing line cuts the intersecting line, is called the centre of the intersecting line.

25. If the original plane be the level of the earth's surface or horizon, it is called the ground plane.

26. If the original plane be the horizon, the vanishing plane is called the horizontal plane.

27. If the picture be perpendicular to the horizon, it is called a vertical picture.

28. When the original plane is the ground plane, the intersecting line is called the ground line.

29. When the original plane is the ground plane, a plane drawn through the eye perpendicular to the ground plane and to the picture, is called the vertical plane.

30. The intersection of a vertical plane with the vertical picture, is called the vertical line.

31. The intersection of the vertical plane with the directing plane, is called the prime director, and by some the eye director.

32. The intersection of the vertical line with the ground plane, is called the foot of the vertical line.

33. The intersection of the vertical director with the ground plane, is called the station point, or prime directing point.

34. The distance between the station point and the foot of the vertical line, is called the station line, or line of station.

35. A straight line drawn between the intersecting and vanishing points, is called the indefinite representation, or projection of that line.

Axiom 1.—The common intersection of two planes is a straight line.

2. The common intersection of two straight lines is a point.

3. If two straight lines meet in a point, or are parallel to each other, a plane may be made to pass through both of them.

4. If a straight line meet two parallel straight lines, or two straight lines meeting in a point, all the three straight lines are in the same plane.

5. Every point in any straight line, is in any plane which the line is in.

6. Two planes which are parallel cannot intersect.

7. One part of a straight line cannot be in a plane while another part is out of it.

Several of these axioms are propositions in the eleventh book of Euclid's Elements, where they are demonstrated; but if the notion of a plane is understood, their evidence will be admitted upon the slightest reflection, so that it would be but of little use to attempt to prove them.

In *Plate I. fig. 1.* W X Z Y is the original plane; A B N I the picture; T S W X the directing plane parallel to the picture; and S V L T the vanishing plane, or parallel of the original plane; V L, the intersection of the parallel of the original plane and the picture, is the vanishing line; I N, the intersection of the picture and the original plane, is the intersecting line; S T, the intersection of the parallel of the

PERSPECTIVE.

original plane and the directing plane, is the parallel of the eye; and WX, the intersection of the directing plane and the original plane, is the directing line.

In all the *figs.* 1, 3, 4, 5, and 6, E is the place of the eye. In *figs.* 2 and 3, the parallel of the original plane is not represented. In each of the *figs.* 1, 4, 5, and 6, the intersecting line is denoted by IN the vanishing line by VL, if necessary in the figure, the directing line by WX, and the parallel of the eye by ST.

Theorem 1.—The indefinite projection of a straight line not parallel to the picture, passes through its intersecting and vanishing points.

This is evident, since the original line and its radial are parallel to each other. The eye, the intersecting point, and the vanishing point, are all in the same plane with the original line and its radial; and, therefore, if a line be drawn in the picture between the intersecting and vanishing points, all the three straight lines will be in the same plane; and, consequently, the indefinite representation will be in the same plane with the original straight line and the eye.

Since the whole practice of perspective depends upon this theorem, our readers will take the following illustration. In *Plate I. fig. 1*, QR is an original straight line, R its intersecting point, *v'* its vanishing point, and R *v'* a line in the picture joining the intersecting and vanishing points. Now since E *v'* and RQ are two parallel lines, let a plane be supposed to be drawn through both, it will pass through the eye at the extremity of the radial *v'E*; and because the straight line R *v'* joins the two straight lines QR and *v'E*, the lines RQ and R *v'* are in the same plane with the eye, and consequently R *v'* is the intersection of the plane of rays on the picture from the straight line QR.

Further, let EF, GH, IK, and LM be parallel original lines, they will have *v'* for their common vanishing point, therefore the several indefinite representations from the intersecting points F, H, K, and M, will all terminate in *v'*.

If an original straight line and its radial are in the same straight line, the whole indefinite representation of that line will be in its vanishing point.

Theorem 2.—The projection of a line parallel to the picture is also parallel to its original.

Let AB, (*fig. 2.*) be an original line parallel to the picture, *ab* its representation, and EAB the optic plane, E being the place of the eye. Now *ab* is the intersection of the optic plane, that is, of the triangle EAB with the picture; and because AB is parallel to the plane of the picture, and AB, *ab* in the plane of the triangle EAB, *ab* is parallel to AB; for if otherwise, AB would meet the picture in the intersection *ab*, or *ab* produced, and consequently could not be parallel.

Corol.—The projections of several lines parallel to one another and to the picture, are also parallel to one another. Thus, if AD and BC be parallel to one another, and to the picture MNIK, *ad* and *bc* will be respectively parallel to AD and BC, their originals.

Theorem 3.—The representation of a line parallel to the picture is to its original, as the distance of the picture is to the distance between the eye, and a plane passing through the original line parallel to the picture; for let the plane QRZY (*fig. 2.*) be parallel to the plane MNIK of the picture; and let EF be drawn perpendicular to the original plane and to the picture, to meet the original plane in F, and the picture in *f*; join AF and *af*, then AEF will be a plane, AF the intersection of the plane of the triangle and the original plane, and *af* the intersection of the plane of the triangle and the picture.

Now in the similar triangles Eab } $Ea : EA :: ab : AB$
and EAB, }
Also in the similar triangles Eaf } $Ea : EA :: af : AF$
and EAF, }
Therefore, by comparing these } $ab : AB :: af : AF$
equal ratios, }

Consequently, the representation of a line parallel to the picture, is to its original as the distance of the picture is to the distance of the eye, and a plane passing through the original line parallel to the picture.

Corol. 1.—The angle which the representations of any two original lines parallel to the picture make with each other, is equal to the angle made by the original lines; because each representation is parallel to its original.

Corol. 2.—The projection of any plane figure parallel to the picture is similar to its original, for let AB and AD be two contiguous original lines, and *ab* and *ad* their representations. Now in the similar

Triangles Eab and EAB, } $Ea : EA :: ab : AB$
Also in the similar triangles Ead } $Ea : EA :: ad : AD$
and EAD, }
Therefore, by comparison, } $ab : ad :: AB : AD$

Consequently, the sides about the equal angles are proportional.

Theorem 4.—The projection of a line is parallel to its director. Because EQ, ED, and *v'R*, (*fig. 1.*) are all in the same plane; and since the directing plane is parallel to the plane of the picture, the director ED is parallel to the indefinite representation *v'R*; because “if two planes be cut by another plane, their common sections with it are parallel.” B. 11. prop. 16. Euclid.

Corol. 1.—The projections of lines that have the same director are parallel to each other.

Corol. 2.—When the original line is parallel to the picture, it is also parallel to its director, and therefore in the parallel of any given plane passing through the original line, and consequently the vanishing line of that plane, and the projection of the line, are parallel to each other.

Theorem 5.—The distance between the projection of any point of a straight line, and the vanishing point of the line, is to the distance between the intersecting point and the vanishing point, as the distance of the picture is to the distance between the directing point and the original point.

That is, in *fig. 1.* $qv' : Rv' :: E'v' : DQ$. Now because of the parallel planes which form the diagram, *v'E'DR* is a parallelogram, therefore R *v'* is equal to D'E'; now the triangles *q'E'v'* and E'D'Q are similar, because their sides *v'q* and E'D' are parallel; therefore $qv' : D'E' \text{ or } Rv' :: E'v' : DQ$.

Corol.—Hence the distance between the representation of any point in a straight line, and the vanishing point of the line, is to the distance between the intersecting point and the vanishing point, as the distance of the picture is to the distance between the original point and the directing plane.

The foregoing theorems, with the following corollaries arising from the definitions, contain all the principles which we conceive necessary in the perspective representation of any rectilinear object. But if the reader is desirous of knowing the best methods for the representation of circular objects, he must be prepared with the knowledge of conic sections, and the harmonical division of lines.

Corol. 1. Proposition.—If there be a straight line opposed to the eye, and not directed to it, the straight lines which issue from all points of it to the eye form a plane.

Corol. def. 5.—Hence the representation of any straight line, rectilinear figure, or solid, is also rectilinear.

Corol. 1. def. 7.—Hence, if the original object be a plane, and

PERSPECTIVE.

and the picture parallel thereto, the representation will be a figure similar to the original.

Corol. 2.—If any part of an original object touch the picture, the part which is thus in contact will be the representation of that part.

Corol. def. 12.—Hence the intersecting points of all lines in any original plane, are in the intersecting line of that plane.

Corol. def. 13.—Hence if any number of original lines be parallel to each other, one line can only pass through the eye parallel to them all.

Corol. def. 14.—Hence if any number of original planes be parallel to each other, one plane only can pass through the eye, which will be parallel to them all.

Corol. 1. def. 15.—Hence the intersecting and vanishing lines are parallel to each other.

Corol. 2.—Hence all original parallel lines have the same vanishing point.

Corol. 3.—Hence the parallels of every two original planes have the same inclination as the originals.

Corol. 4.—The vanishing point of the common intersection of any two original planes, is the common intersection of the vanishing lines of these planes.

Corol. 1. def. 16.—The vanishing points of all original lines in the same plane, are in the vanishing line of that plane.

Corol. 2.—Hence any number of original parallel lines can have only one vanishing point.

Corol. 3.—Hence original lines which are parallel to the picture have no vanishing point.

Corol. 4.—The radials which generate the vanishing points of two originals make the same angle with the eye as the originals with each other.

Corol. def. 18.—Hence the intersecting line, the vanishing line, the parallel director, and the directing line, are all parallel to each other.

Corol. def. 19.—Hence the directing points of all lines in the same original plane, are in the directing line of that plane.

Corol. 1. def. 22.—Hence a line drawn from the centre of the picture to the centre of a vanishing line, is perpendicular to that vanishing line.

Corol. 2.—The distance of a vanishing line is the hypotenuse of a right-angled triangle, the base of which is the distance of the picture, and the perpendicular the distance between the centre of the picture and the centre of the vanishing line.

Description of the Diagrams for illustrating the Principles of Perspective.—In *fig. 1.* is shewn the method of finding the representation of a point, first by the intersecting and vanishing points. Let Q be any point in the original plane. Through Q draw any line, QR , meeting the intersection IN at R ; and through E' draw $E'v'$ parallel to QR , meeting the picture in v' ; join $v'R$, and draw the visual ray QE' cutting the indefinite representation $v'R$ at q , the representation of the point Q ; because from theorem 1, the indefinite representation of a line passes through its intersecting and vanishing point, and because the visual ray EQ is in the same plane with the parallelogram $RDEv'$, $E'Q$ will therefore cut Rv' at q .

Secondly, by the intersecting and directing points. Draw any line, QD' , through the original point, cutting the intersection IN at R , and the directing line WX at D' ; join $D'E'$, which will be the director of the original line by definition 19; draw Rv' parallel to $D'E'$, and draw the visual ray QE' , cutting Rv' at q , then q is the representation of Q , as before. For since $RDEv'$ is a plane, and

the points E' and Q , and the indefinite representation Rv' in that plane: the visual ray joining E' and Q must cut Rv' at q .

This diagram also shews, that if LM and QR be two original lines, having the same directing point D' , and if M and R be the intersecting points, the indefinite representations Mv' and Rv' will be parallel. This appears from *corol. 1. theorem 3.*

In this diagram it is also shewn, that if EF , GH , IK , LM , be several parallel lines intersecting the picture at F , H , K , M , and if the radial $E'v'$ be drawn parallel to any one of them cutting the picture in v' , their indefinite representations will terminate in v' . This appears evident, since any one of the lines EF , GH , &c. is in the same plane with $E'v'$, from the fourth axiom, and because the eye at E' is in $E'v'$, each of the indefinite representations will be cut by any visual ray from its original to the eye at E' .

Fig. 2. shews the representation of a plane figure parallel to the picture. Let the original figure be $ABCD$, in the plane $QRZY$ parallel to the picture $INMK$, and let E be the place of the eye in the directing plane GHW . Draw any director $E'D'$ through each angular point A , B , C , D , of the figure; draw AP , BS , CT , DQ , parallel to $E'D'$, cutting the original plane in P , S , T , Q ; draw $D'P$, $D'Q$, $D'S$, $D'T$, cutting the intersecting line in p , q , s , t ; draw pa , sb , tc , qd , parallel to $E'D'$: from the angular points A , B , C , D of the original figure, draw the visual rays $E'A$, $E'B$, $E'C$, $E'D$, cutting the plane of the picture $INMK$ respectively at the points a , b , c , d , in the lines pa , sb , tc , qd . Because AP , ap , and $E'D'$, are parallel to each other, they are therefore in the same plane; therefore the straight line Ae' will cut pa at a , consequently, a is the representation of A . In the same manner it may be proved that b is the representation of B , and so on of the rest.

Fig. 3. shews the representation of a plane figure by means of the directing plane in a plane inclined at any angle, or perpendicular to the picture. Let $ABCD$ be the original figure. Take any point D' in the directing line WX as a directing point; draw the director $D'E'$; from the angular points A , B , C , D , draw AD' , BD' , CD' , DD' , cutting the intersecting line at p , q , s , t ; draw pa , qb , sc , td , parallel to the director $D'E'$; draw the visual rays Ae' , Be' , Ce' , De' , cutting the lines pa , qb , sc , td , at the points a , b , c , d , and $abcd$ is the representation of the figure $ABCD$; for pa is parallel to $D'E'$, and the straight line AD' joins these parallels; therefore pa , $D'E'$, and AD' , are in the same plane; and because the angular point A , and E' the place of the eye, are in that plane, the visual ray Ae' is also in that plane, and therefore will cut pa at a . In the same manner each of the other points b , c , d , may be proved to be the representation of each of the points B , C , D .

Fig. 4. shews the representation of a plane figure in a plane inclined to the picture at any angle, or perpendicular to it, by means of a directing point and the vanishing points of the sides.

Let the quadrilateral $ABCD$ be the original figure. Take any directing point D' , and draw $D'E'$ the director; draw the radial $E'v'$ parallel to AD' and BC , cutting VL , the vanishing line, at v' ; also draw the radial $E'v''$ parallel to AB and DC , cutting VL at v'' . Then if the figure be a parallelogram, draw lines to the directing point D' from each of the nearest angular points, B , A , D , to cut the intersecting line IN at p , q , s ; draw pb , qa , and sd , parallel to $E'D'$; produce the side BA of the

PERSPECTIVE.

original figure to meet the intersection $I'N'$ at t ; join $t v'$, cutting qa at a , and pb at b , then a is the representation of the point a ; join $a v'$, cutting sd in d , and draw $b v'$ and $d v'$, cutting each other at c , then $abcd$ is the representation of $ABCD$, as required. For $t v'$ is the indefinite representation of BA by theorem 1, and qa is the representation of the line qA , theorem 3; and since the original lines BA and qA meet or cut each other at A , their indefinite representations will also meet each other at a , and because the vanishing point of a line is a point in the indefinite representation; and if two points in the indefinite representation are found the whole indefinite representation may be drawn. Now since a is the representation of the point A , and v' the representations of another point in the side AD , $a v'$ will be the indefinite representation of AB . In the same manner it may be shewn, that $a v'$ is the indefinite representation of AD : then since sd is the representation of sD , and the point D is both in sD and AD , therefore its representation d is at d , the intersection of sd , and $a v'$, the indefinite representation of these lines: for the same reason b is the representation of B , and by reasoning as above, it may be shewn that c is the representation of C . Therefore the whole figure $abcd$ is the representation of $ABCD$. It is upon this principle that most architectural drawings are put in perspective, by only using the original plane, first supposing the picture, the vanishing plane, and the directing plane, removed: they first draw the plan, $ABCD$, of the building or edifice, and fix upon D' as a station point, and then draw the intersection $I'N'$, then draw lines from the several points to cut $I'N'$; and supposing the picture to stand perpendicular to the original plane, as is generally the case, the directing plane $STXW$ will also be perpendicular to the original plane; then as D' in this case is the station point, the director $D'E'$ becomes perpendicular also to the original plane, and hence the directorial indefinite representations sd , qa , pb , will be perpendicular to the intersection $I'N'$. Then taking another separate piece of paper for the picture, draw two parallel lines $I'N'$ and $V'L'$ at a distance from each other, equal to the height of the eye, $I'N'$ being the intersecting line, and $V'L'$ the vanishing line; then transferring all the intersections to $I'N'$ on the picture, draw lines from each point perpendicular to $I'N'$, and they will give the directorial indefinite representations; then the vanishing points being found upon the original plane, the whole object may be represented with more advantage in this manner than in any other, as the indefinite representations of all lines on the original plane fall in the same straight lines with the representations of original lines perpendicular to the original plane from the same original points.

Fig. 5. shews the representation of a plane figure by means of vanishing points only; *viz.* by finding the vanishing points of the sides, and producing the sides of the original figure to their intersecting points, then the intersections of the indefinite representations will form the figure $abcd$, which is the representation of the original figure $ABCD$, depending entirely upon theorem 1.

This method is, however, not so convenient as the station point or prime directing point, as it requires much more space to produce all the original lines, than to draw them from each of the points of the object to the directing point, and more particularly when the plan of the object is very remote from the intersecting line, or when large in proportion to the distance, and on this account, though elegant in theory, it is not eligible for practice.

Fig. 6. is here given, in order to shew that it will be the same thing, whether the plan of the object is laid on the va-

nishing plane, extended beyond the picture, or upon the original plane, the point E' for the eye and the vanishing line being situated in the same manner with respect to the figure $abcd$, that the point D' and the intersection $I'N'$ are in respect to the similar and equal figure $ABCD$. For let the figures $abcd$, and $ABCD$, be placed so that the corresponding sides ab , AB , cd , CD , &c. shall be parallel; then suppose the lines aA , bB , &c. to be joined, then these lines will also be parallel to each other; and because the points D' and E' are alike situated to each of these figures, if $D'E'$ be joined, $D'E'$ will be parallel to aA , bB , &c. and parallel to the plane $I'N'L'V'$. Let $D'v$ be drawn parallel to AB , meeting $I'N'$, or $I'N'$ produced at v ; draw $D'C'$ perpendicular to $I'N'$, cutting it in C' ; also draw $E v'$ parallel to ab , meeting $V'L'$, or $V'L'$ produced at v' , and draw EC'' perpendicular to $V'L'$, meeting it in C'' , then the intersecting points G , M , N , will have the same distances in respect of each other, and with respect to v and C' , that g , m , n , have in respect to each other and to the points v' and C'' ; it will therefore be the same thing whether we use the vanishing plane, or the original plane, in order to ascertain the intersections, the centre and distance of the picture, and the vanishing points, so as to draw the object unconnected with the original plane, as explained in *fig. 4.* as each of the lines drawn in the one plane has the same extension as its correspondent line in the other, and the angle made by any two adjoining lines in the one plane, is equal to the angle formed by the corresponding lines of the other.

The foregoing diagrams, with the explanations which accompany them, shew the nature of forming the representation from the original object, supposing all the planes to exist in their real position; but this is not the case in practical perspective; the picture, the original plane, and the vanishing plane, must be reduced to one plane surface in the following manner: suppose the intersection, the vanishing line, the parallel of the eye, and the directing line, to be as hinges to the four planes, *viz.* the plane of the picture, the directing plane, the part of the original plane between the intersecting and directing lines, and the vanishing plane: now as these planes are all parallelograms, and the opposite planes being equal, they will, therefore, continue parallel in all positions when moved round the four hinges, and consequently may be all made to coincide in one plane: now let it be supposed that the picture, the directing plane, and the vanishing plane, are moveable upon the original plane, which remains stationary, and let these planes be made to coincide with the original plane, so that the picture may cover that part of the original plane between the intersecting line and the directing line, either entirely, or in part, then by this means the part of the original plane beyond the intersecting line will be wholly uncovered. Suppose all the radials to have been previously drawn on the vanishing plane, in order to produce the vanishing points, it is evident that these radials will be still parallel in the coincident state of the planes. The practice, with regard to the use of vanishing points, may therefore be as follows: upon any convenient part of the paper draw two parallel lines for the intersecting and vanishing lines, then the area or space comprehended between these lines is the picture, the space adjacent to the intersection is the original plane, and the space adjacent to the vanishing line is the vanishing plane, so that the picture lies between the vanishing and original planes: draw the original figure in the original plane in the intended position to the intersecting line, and fix upon the eye with regard to its distance from the vanishing line, and its position in regard of the station line: draw lines through the eye parallel to the sides of the original figure as radials, in order to produce the vanishing points; continue the sides of the original figure to the intersecting

PERSPECTIVE.

fecting line, and join the corresponding intersecting and vanishing points, then the space inclosed by the indefinite representation will be the representation of the original figure. For if the whole scheme were supposed to be raised into its original position, the eye would be brought into its true place, the radials would be parallel to the original sides of the object, and the indefinite representations would be in the same plane with the radials and sides of the original object. Though the space between the intersecting and vanishing is called the picture, the picture is by no means limited to this space, but extends upwards, and covers the vanishing lines plane, so that, in most cases, what is commonly called the picture is the least part of it, except in bird's-eye views, or where the horizon is taken very high in consequence of the spectator being placed upon an elevated situation.

In the practice of perspective, where the plan of the object is given, the principal directing point used in conjunction with the vanishing points of the sides is the most convenient, as has already been observed; the vanishing plane is here supposed to be removed, as all the planes in the practice of perspective delineation are supposed to coincide. The intersecting and vanishing lines may be drawn as before; then the principal directing point or station point may be fixed in the same position to the intersecting line, that the eye is in regard of the vanishing line; then the eye and the station point will be at a distance from each other, equal to the height of the picture, and in a straight line perpendicular to the intersecting line; or the distance of the eye from the vanishing line will be equal to the distance of the station point from the intersecting line; also the position and distance of the eye from the object will be the same as when all the planes are brought into their real position.

It must be here observed, that in the motion of these planes round the principal line, as before observed, the parallel of the eye and the vanishing line always keep the same parallel distance in all positions; but these lines vary in respect of the object in the original plane, because these lines are not in the same plane with the original plane; and the intersecting and directing lines, also the original figure, are in the same plane, *viz.* in the original plane. Therefore the station point, or any other directing point, may be fixed in position to the original object and intersecting line. This is the foundation of the practice of perspective with regard to the use of the directing line, and, therefore, the directing point has the same relation to the intersecting line that the eye has to the vanishing line.

In order to prevent repetition in the enunciation of the following problems, the eye, the vanishing line, and intersecting line, are always given in position; the eye is denoted by E' , the vanishing line by VL , and the intersecting line by IN ; but as the original object may be of an indefinite number of forms, it is only enunciated in each problem.

PROBLEM I. *Plate II. Figs. 1 and 2.*

Given any original straight line AB , oblique to the intersection IN , to find its indefinite representation.

Produce AB to its intersecting point B ; through E' draw the radial $E'v'$, and join Bv' ; then Bv' is the indefinite representation of the line AB . Theorem 1.

If there be any number of original parallel lines AB , $A'B$, &c. and if B , B , &c. be their intersecting point, and v' the vanishing point of any one, it will be the vanishing point of the whole system. Corol 2. def. 16.

PROB. II. *Figs. 3 and 4.*

Given any original point A , to find its representation.

Draw any two lines through the point A , find each of

their indefinite representations Cv' , Bv' , problem 1, and the intersection a of Cv' , Bv' , will be the representation of the original point A .

For since the original point, A , is in each of the original lines AB and AC , the representation, a , of the point, A , is in each of the indefinite representations, and is therefore at a , their intersection.

PROB. III. *Fig. 5.*

Given any original line AB , oblique to the intersection, to find its representation.

Find the indefinite representation Cv of AB by problem 1; draw AE and BE' , cutting Cv at a and b , then ab is the representation of AB .

For let AE' intersect IN at D , and VL at G , then D is the intersecting point, and G the vanishing point of the original line AD ; therefore GD is the indefinite representation of AD ; and since vC is the indefinite representation of the original line AB , and since each of the original lines is drawn from the point A , the intersection, a , of the two indefinite representations Cv and DG will be the representation of the point A by problem 2. In like manner it may be shewn that b is the representation of the point B , therefore ab is the representation of AB .

PROB. IV. *Fig. 6.*

To find the representation of any original line AB parallel to the picture.

Find a , the indefinite representation of the point A , problem 2; draw ab parallel to the original line AB ; join BE' , cutting ab at b , then ab is the representation of AB .

For since a is the representation of A , problem 2, and since any original line parallel to the intersection must have its representation also parallel to the intersection; and, lastly, because b is the representation of B , ab is the representation of AB . For it may easily be shewn, that if two planes cut one another, and if these be cut by a third plane, so that its intersection with one of them shall be parallel to the intersection of the two first, the other intersection will also be parallel to the two first.

PROB V. *Fig. 7.*

An original oblique line AB , being divided into several parts, to find the representation of the parts.

Find the representation, ab , of the original line AB , problem 3, and through the several divisions of the parts in AB draw lines to the eye at E' , cutting ab at e and f , then be , ef , fa , are the parts corresponding to those of the original line AB .

This is evident from problem 2.

PROB. VI. *Fig. 8.*

Given the seat, A , of an original line parallel to the picture, and perpendicular to the original plane, to find the representation of the said line.

Through A draw any line AB , cutting IN at B , and find its indefinite representation Bv , problem 1, and find the representation, a , of the point A in the indefinite representation Bv ; draw BC and ad perpendicular to IN ; make BC equal to the original line; draw Cv , cutting ad at d , then ad is the representation of the original line insisting upon the given point A .

Demonstration to Problem VI.—For, suppose the plane $INLV$ of the picture to be raised perpendicular to the original plane, and the objective line to be raised in position; also imagine a straight line drawn through the other extremity of the objective line, out of the original plane, parallel to

PERSPECTIVE.

to AB , till it cut the picture; this line, so drawn, will form the side of a parallelogram, of which AB is the opposite side, and the objective line insinuating upon A , and BC the other two opposite sides; therefore BC will be equal to the objective line, and the point C is the intersection of the side of the parallelogram opposite to AB ; and because v is the vanishing point of AB , it will also be the vanishing point of the side of the parallelogram opposite to BC ; therefore Cv will be the indefinite representation of the side of the parallelogram opposite to AB ; and because the point a , in the indefinite representation Bv of AB , is the representation of the point A , and because both ad and the original line are each parallel to BC , and ad is terminated at d by Cv ; ad is the representation required.

The following four problems are performed by means of the prime directing point and one vanishing point; where, observe that C' is the centre of the picture, found by drawing $E'C'$ perpendicular to the vanishing line VL , as in definitions 21 and 22; D' the prime directing point in $E'C'$, found by making $E'D'$ equal to the height of the picture, or making the distance between D' and the intersecting line equal to $C'E'$, the distance between the vanishing line and the eye.

PROB. VII. Fig. 9.

To find the representation of a line AB oblique to the intersection.

Find the indefinite representation Cv of AB by problem 1; draw AD' and BD' , cutting IN at D and E ; draw Ea and Db parallel to $D'E'$, cutting Cv at a and b , then ab is the representation of AB .

For since the representations of the points A and B are in Cv , the indefinite representation of AB , and because $E'D'$ is the director of the original lines AE and BD , and E and D the intersecting points of these lines, Ea and Db , drawn parallel to $E'D'$, will be the indefinite representations of AE and BD ; therefore the representations a and b , of the points A and B , are in these indefinite representations, theorem 3; but they are also in the indefinite representation Cv ; and, consequently, in a and b , the intersections of the indefinite representations, whose director is $D'E'$, and the indefinite representation Cv , whose vanishing point is v , therefore ab is the representation of AB .

PROB. VIII. Fig. 10.

To find the representation of an original line AB , parallel to the intersecting line.

Through either extremity A , draw any line Ae , meeting the intersection in e ; find the indefinite representation ev of Ae , problem 1; draw $D'A$ and $D'B$, cutting IN at c and d ; draw ca parallel to $D'E'$, cutting ev at a ; draw ab parallel to AB ; and draw db parallel to $E'D'$, cutting ab at b ; then ab is the representation of AB .

For the representation of the point A is in the indefinite representation ev of Ae , problem 1; it is also in the indefinite representation ca of Ae ; therefore the representation of A is at the point a , the intersection of these two indefinite representations; and because the original line, AB , is parallel to the intersection, ab will also be parallel to the intersection; therefore the representation of the point, B , will be in the line ab ; but the representation of B is also in the indefinite representation, db , of the line Bd ; wherefore the representation of the point, B , being both in ab and db , must be at b , their intersection; wherefore ab is the representation of the line ab .

PROB. IX. Fig. 11.

To find the representation of parts AD , DE , EB , into which an original line AB , oblique to the intersection, is divided.

Find the indefinite representation, cv , of the line AB , by problem 1; then by the directing point D , and director $D'E$, find the representations a, d, e, b , of the original points A, D, E, B , as in problem 7.

Then ad, de, eb , are the representations of AD, DE, EB .

This is evident from the demonstration, problem 7.

PROB. X. Fig. 12.

To find the representation of a line parallel to the picture perpendicular to the original plane.

Find the indefinite representations, bv and cv , of any straight line Ab , and that of another parallel to it, passing through the other extremity of the objective line out of the original plane, as in problem 6; draw AD' , cutting IN at f ; and draw fd parallel to $D'E'$, cutting bv at a , and cv at d ; then ad is the representation required.

This is evident from the demonstration of problem 6, and because the director, $D'E'$, is perpendicular to the intersecting line IN , the indefinite representation af of Af , as well as the representation, ad , of the original of the objective line, are perpendicular to IN ; and because the point, a , is common to the two straight lines af and ad , af is in the same straight line with ad , and, consequently, they make only one straight line, fd , perpendicular to IN .

The following problem shews the method of finding the representation of plane figures by means of the vanishing points.

PROB. XI. Figs. 13, 14, and 15.

To find the representation of any plane rectilinear figure in the original plane.

Find the indefinite representation of every side of the original figure by problem 1, and the intersections of all the indefinite representations will form the representation of the figure required.

If the vanishing points of any original line exceed the limits of the picture, the extremities of that line may be found by problem 3, or by problem 7.

Parallelograms will have two vanishing points.

The foregoing problems are requisite in finding the representation of an object in the original plane. The following is to obviate the necessity of drawing the original object, or having it given but to perform the operation from a knowledge of the construction of the figure.

PROB. XII. Plate III. Fig. 1.

Given the vanishing and intersecting points of a line, the distance of any point in that line from the intersecting point, as also the length of the radial, to find the representation of the point.

Let v' be the vanishing point, d the intersecting point; join dv' ; through v' draw any line, $v'f$, and through d draw db , on the contrary side of dv' , parallel to $v'f$; make db equal to the distance of the original point from the intersecting point d , and make $v'f$ equal to the distance between the vanishing point, v' , and the eye E' ; join fb , cutting dv' at m , then m is the point required.

This proposition is manifest from theorem 4. But, for the conveniency of practice, the distance of the eye from the vanishing point is transferred upon the vanishing line from the vanishing point; and, consequently, the distance of the original

PERSPECTIVE.

original point from the intersecting point, is transferred upon the intersecting line from the intersecting point, in order to save room: thus, if $V'L'$ be the vanishing line, $I'N'$ the intersecting line, E' the place of the eye, a an original point, drawing any line ad , and its radial $E'v'$, and joining the vanishing point, v' , to the intersecting point d and making $v'1$, on the vanishing line, equal to $v'E'$, the distance of the eye, and dc on the intersecting line equal to da , the point, m , will be found the same, whether aE' , bf , or $c1$, be joined, as is evident, because the indefinite representation, $d'v'$, is divided into two portions in the constant ratio of ad to $v'E$.

PROB. XIII. Fig. 2.

Given the vanishing and intersecting lines of a plane, the vanishing and intersecting points, v' and d , of an indefinite line in that plane, the distance of the eye, and the distance of a point in the original line, to find the representation of the point.

Join $v'd$, the intersecting and vanishing points; make $v'1$ equal to the distance of the eye, and dc equal to the distance of the point in the original line; join $c1$, cutting $d'v'$ at m , and m will be the representation of the original point.

This appears evident from problem 12.

PROB. XIV. Fig. 3.

The vanishing and intersecting lines of a plane, the vanishing and intersecting points, v' and d , of a finite line on that plane, the distance of the vanishing point from the eye, and the distance of the nearest extremity of the line to its intersecting point being given, to find the representation of the line.

Join $v'd$, the indefinite representation; make $v'1$ equal to the distance of the eye on the vanishing line, also da equal to the distance of the nearest extremity, and ab equal to the original line on the intersection IN ; join $a1$, cutting $v'd$ at f , and $b1$ cutting $v'd$ at g , then fg is the representation of the original line.

This appears evident from problem 12, as the points f and g are each the representation of a point in the original line.

PROB. XV. Fig. 4.

The definite representation ae , and the vanishing point, v' , of a line being given, to divide ae , representing the original line, consisting of parts of a given ratio.

Through either extremity, a , of the definite representation, draw IN at any angle with av' , and through v' draw $v'1$ parallel to aE , on the contrary side of av' ; make aB , BC , CD , DE , equal to the parts of the original line, or in the same ratio; join Ee , which produce to 1 ; also join $B1$, $C1$, $D1$, cutting ae at b , c , d ; then ae is divided as required.

For in the similar triangles,

$$\begin{aligned} baB \text{ and } bv'1, & \quad ba : aB :: bv' : v'1 \\ caC \text{ and } cv'1, & \quad ca : aC :: cv' : v'1 \\ daD \text{ and } dv'1, & \quad da : aD :: dv' : v'1 \\ eaE \text{ and } ev'1, & \quad ea : aE :: ev' : v'1 \end{aligned}$$

Therefore alternately,

$$\begin{aligned} ba : bv' :: aB : v'1 \\ ca : cv' :: aC : v'1 \\ da : dv' :: aD : v'1 \\ ea : ev' :: aE : v'1 \end{aligned}$$

And because the parts aB , aC , aD , aE , continue in the same ratio with $v'1$, the points, a , b , c , d , e , will be invari-

able, whatever angle the lines $a'E$ and $v'1$ form with $v'a'$ and whatever be the lengths of aB , aC , aD , aE ; and because the lines $a1$, $B1$, $C1$, $D1$, $E1$, represent a series of parallels, cutting the original of ae , the points a , B , C , D , E , will represent the intersections, and $v'1$ the distance of the eye.

PROB. XVI. Fig. 5.

The centre C , and distance of the picture, the vanishing and intersecting lines of a plane, the vanishing point of a finite line in that plane, the seat x , and distance of the nearest extremity of that line from its seat being given, to find the representation of the line.

Make $C'D$ on the vanishing line equal to the distance of the picture, and xy on the intersecting line equal to the distance of the seat of the nearest extremity of the given line; join $C'x$ and yD , cutting each other in g ; join gv' ; find the point 1 , such that the distance $v'1$ may be equal to the hypotenuse of a right-angled triangle, whose base is $v'C'$, and perpendicular $C'D$ the distance of the picture; draw $1ga$, cutting $I'N'$ at a ; make ab equal to the original line; join $b1$, cutting gv' in b , and gb is the representation required.

PROB. XVII. Fig. 6, N^o 1.

The centre and distance of the picture, the vanishing and intersecting line of a plane perpendicular to the picture, the seat of the nearest extremity of a line in that plane, the length of the line, and its inclination to the intersecting line being given, to find the representation of the line.

In N^o 1, let x be the seat of the nearest extremity of the line; make xy equal to its distance, and make $C'D$ equal to the distance of the picture; join $C'x$ and Dy , cutting each other at g . In N^o 2, make any angle acc , on the line ae ; make ea to eb as radius to the cosine of inclination of the given side; make ec equal to its length; find ed a fourth proportional to ea , eb , ec ; transferred to $I'N'$, N^o 1, from x to f , and draw fc cutting gv' at b , then gb is the line required.

This is evident, if we consider the points, a and b , in the original lines perpendicular to the picture; then the space intercepted upon the intersecting line by the two perpendiculars, will be in the same proportion to the original line as radius to the cosine of inclination.

PROB. XVIII. Figs. 7 and 8.

Given the indefinite representation of two lines in the same plane, intersecting each other at b ; a finite portion, ba , of the indefinite representation bv' , and the distance of the eye, $v'1$ and $v'2$, from each vanishing point, v' , v'' ; to find a portion of the indefinite representation bv'' , the original of which shall be equal to that represented by ab , or in any given ratio with the original of AB .

Through the point b , draw de parallel to the vanishing line $V'L'$; join $1a$, which produce to d , in fig. 7, but to cut ed in d , fig. 8; make be to bd in the ratio required, and join $e2$, cutting bv'' at c ; then the original of ba will be to the original bc as bd to be , as required.

This is evident by considering ba as the representation of a line inclined to, and bd the representation of another coinciding with, the picture, and 1 the vanishing point of a line forming the base of an isosceles triangle with each of these lines; therefore, abd will be the representation of an isosceles triangle, of which ad will represent the base, and ab and bd the two equal sides: in like manner, bce will represent an isosceles triangle, of which ce will represent the base, and cb , be , the two sides.

PERSPECTIVE.

In this and the following examples, where the representations of lines are required to be delineated without the use of the geometrical plane; the vanishing points are always marked v , with an index over the right-hand side of it, in order to distinguish the number of vanishing points: thus, v^1, v^2, v^3 , &c. denote the first, second, and third vanishing points. The distances of these vanishing points are simply denoted by their indexes: thus, 1 placed upon the vanishing line, denotes the distance of the vanishing point v^1 from the eye, 2 of v^2 , and so on of others.

PROB. XIX. Fig. 9.

The indefinite representations, $c v^1$ and $a v^1$, of two lines in the same plane; the distances, $v^1 1$ and $v^2 2$, of their vanishing points, v^1 and v^2 , on the vanishing line, $V L$, of their plane; also, a finite portion, $c d$, of the indefinite representation $c v^1$, being given: through a given point, a , in the indefinite representation $a v^2$, to represent the length of an original line, which shall be equal to, or in a given ratio to, the original line represented by $c d$.

Through c draw $g f$ parallel to $V L$, and through a draw $a b$ parallel also to $V L$; join 1 d , and produce it to g ; also produce the indefinite representation $v^2 a$ to meet $g f$ in e ; make $e f$ to $e g$, in the ratio of the original to be represented from the point a , on the indefinite representation $a v^2$, to the original represented by $c d$; join $f v^2$ cutting $a b$ at b , and join $b 2$ cutting $a v^2$ at b ; then $a b$ is the representation required.

For $a c b f$ represents a parallelogram, with two sides parallel to the picture; and because $e f$ and $a b$ represent opposite sides, the original of $e f$ is equal to the original of $a b$; and because $b a b$ represents an isosceles triangle, of which $b b$ is the base, the original of $a b$ is equal to the original of $a b$, therefore the original of $a b$ is equal to the original of $e f$; and because $d c g$ represents an isosceles triangle, the original of $e g$ is equal to the original of $c d$; and because $c g$ and $e f$ are in a line parallel to the vanishing line, the originals of $c g$ and $e f$ are parallel in the same indefinite line to the intersecting line of their plane, and have the same ratio as the representations $c g$ and $e f$; therefore the original of $c d$ has to the original of $a b$ the ratio of $c g$ to $e f$, as required.

PROB. XX. Fig. 10.

Given the eye, the vanishing and intersecting lines, and place of the eye in position; to find the representation of a parallelogram, whose angles and dimensions, also the seat, x , of the nearest angular point, and its distance from the intersecting line, are known.

Draw $E' C'$ perpendicular to $V' L'$, the vanishing line, cutting it in C' , the centre of the picture; make $C' D'$ equal to $C' E'$, and $x y$ equal to the distance of the nearest angular point of the parallelogram from the intersecting line; join $x C'$ and $y D'$, cutting each other in e , the representation of the nearest angle, as in problem 16. Through E' draw $M N$ parallel to $V' L'$; make the angle $M E' v^1$ equal to the angle which the side of the original parallelogram, adjoining the nearest angle, makes with the intersection, or makes with a line drawn from the nearest angle parallel to the intersection; make the angle $v^1 E' v^2$ equal to the nearest angle of the parallelogram; join $e v^1$ and $e v^2$; from the indefinite representation $e v^1$, cut off the portion $e f$, to represent a line equal to the original side, of which $e v^1$ is the indefinite representation, by problem 16; that is, make $v^1 1$ equal to $v^1 E'$; join 1 e , and produce it to meet the intersecting line in a ; make $a b$ equal to the original side; join $b 2$, cutting $e v^1$ at f ; in like manner, make $v^2 2$ equal to

$v^2 E'$, and join $2 e$, cutting the intersecting line in c ; make $c d$ equal to the other adjoining side of the nearest angle, and join $d 2$, cutting $e v^2$ at b ; join $b v^1$ and $f v^2$, and $e f g b$ is the parallelogram required.

The original figure, though here shewn, is of no other use than to assist the imagination in the construction.

PROB. XXI. Fig. 11.

Given the intersecting and vanishing lines, and the place of the eye in position, the seat x , the distance of the centre of a circle, and its radius, to find the representation of the circle.

Method 1.

Make $x y$, on the intersecting line, equal to the distance of the centre of the original circle from its seat x , and $C' D'$ on the vanishing line equal to $C' E'$, the distance of the eye; join $x C'$ and $y D'$, cutting each other in e , the representation of the centre of the circle; through e draw $c d$ parallel to $V' L'$, the intersection; make $x a$ and $x b$ each equal to the radius of the circle; join $C' a$, cutting $c d$ in c , and $C' b$, cutting $c d$ in d , and $c d$ is the representation of a diameter parallel to the picture; then to find the representation $f g$ of any diameter drawn through c at pleasure; produce $f g$ to its vanishing point v^2 ; make $v^2 2$, on the vanishing line, equal to $v^2 E'$, the distance of the eye from the vanishing point; join $2 c$, cutting $f g$ in g , also $2 d$, and produce it to f ; then $f g$ is the representation of a diameter of the original circle inclined to the intersecting line. In like manner may the representations $h i$, $k l$, $m n$, be found; viz. by transferring the distance of each of their vanishing points from the eye on the vanishing line, and drawing two lines from each point of distance to c , and d , the one cutting, and the other produced till it cut the indefinite representation belonging to the distance so transferred, then a curve being drawn through all the extremities of the representative diameters, will be the representation of the circle required.

The original circle, A , is placed in its position for the same reason as before given, prob. 21. This is an application of problem 18, from which its evidence appears.

The following are several easy methods of drawing the representation of a circle, and are exceedingly useful where accuracy is required, particularly in the representation of large circles.

The intersecting and vanishing lines, the centre and distance of the picture, the seat and distance of the centre, and the radius of the circle, are supposed to be given till it is otherwise announced; C' denotes the centre, and $C' D'$ the distance of the picture, and x the seat of the centre of the circle, and $x y$ its distance, as in prob. 20, 21.

Method 2. Fig. 12.

Draw $x A$ perpendicular to $V' N'$; make $x E$ and $x D$ each equal to $x A$; describe the arc $C x B$; join $A E$ and $A D$, cutting the arc $C x B$ at C and B ; draw $C F$ and $B G$ perpendicular to $V' N'$, cutting $V' N'$ at F and G ; join $E C'$, $F C'$, $x C'$, $G C'$, and $D C'$; also join $y D$, cutting $E C'$, $F C'$, $x C'$, $G C'$, and $D C'$, at b, m, n, k , and d ; draw $b a$ parallel to $V' N'$, cutting $x C'$ in e , and $D C'$ at a ; draw $d c$ parallel to $V' N'$, cutting $x C'$ in g , and $E C'$ at c ; through n draw $f b$ also parallel to $V' N'$, cutting $E C'$ at f , and $D C'$ at b ; join $a c$, cutting $G C'$ at b , and $F C$ at l , and $a c$ will also cut $f b$ or $y D'$ at n ; through the points e, b, k, g, l, f, m, c , draw a curve, which will be the representation of the circle required.

This will easily appear, when it is considered that the tan-

PERSPECTIVE.

gent of 45 degrees is equal to the radius, or by inspecting *fig. 14*, where the part *MFG* is equal and similar to *AED*.

Method 3. Fig. 13.

Make *xb* and *xa* each equal to the radius of the circle; join *bC'*, *xC'*, and *aC'*; make *xy* equal to the distance of the centre of the circle from its seat *x*, and join *yD'*, and complete the representation *d c f e* of the circumscribing square, as in *fig. 12*; divide the representation *bg*, of the parallel diameter, into seven equal parts, setting one-seventh from *b*, and the other seventh from *g*, each towards the centre; draw *kl*, and *mn*, tending to *C'*, cutting the diagonals in the points *k, l, m, n*, then through the points *l, h, k, p, n, g, m, q*, draw a curve, which will be the representation required.

This will readily appear by observing in *fig. 12*, that the representation of the parallel diameter *fb* is divided in the same proportion as *ED*, or as *EA*, *fig. 14*; now *EL*, *KA*, *FH*, or *IG*, *fig. 14*, is very nearly equal to one-seventh of the diameter *EA*; draw *MC* perpendicular to *EA*, cutting the semi-circumference at *C*; through *C* draw *FG* parallel to *EA*, and through *E* and *A* draw *EF* and *AG* parallel to *MC*, and join *FM* and *GM*, cutting the circle in *D* and *B*; through *D* and *B* draw *LH* and *KI* parallel to *MC*, cutting *EA* at *L* and *K*, and *FG* at *H* and *I*.

Now suppose the diameter *EA* to consist of seven equal parts, then the radius *ME* or *MA* will be 3.5, that is, *MD*, or *MB*, will be 3.5.

By Euclid, b. i. prop. 47, the square of *MD*, or *MB*, is equal to the squares of *ML* and *LD*; but *ML* is equal to *LD*, therefore the square of *MD* is double the square of *ML*; that is, the square of *ME* is double of the square of *ML*; hence *ML* will be obtained arithmetically thus:

$$LM = \left(\frac{ME^2}{2}\right)^{\frac{1}{2}}; \text{ therefore } EL = EM - LM =$$

$$EM - \left(\frac{ME^2}{2}\right)^{\frac{1}{2}} = 3.5 - \left(\frac{3.5^2}{2}\right)^{\frac{1}{2}} = 1.026, \text{ \&c.}$$

which is exceedingly near to unity, the error being in excess.

Fig. 15, is an application of method 3, *fig. 13*, to planes at different altitudes, to obtain the representation of a circle, when the seat of its centre is given on the original plane, and the seat of the centre of the circle on the original plane, given on the intersecting line, and the distance of the seat of the centre of the circle on the original plane, from its seat on the intersection also given. The ellipsis below is the representation of a circle below the eye.

To represent a circle above the level of the eye, let *x* be the seat of the centre of the circle on the original plane, given on the intersecting line; let *xy* be the distance of the two seats. Draw *yo* perpendicular to *I'N'*, and make *yo* equal to the distance of the centre of the circle from its seat on the original plane; draw *oD'*; then having found the representation of the circle below the eye on the original plane, as in method 3, *fig. 13*, let *ce* be the representation of the diameter parallel to the picture, and *a* the representation of the centre; draw *ap* parallel to *yo*, cutting *oD'* in *p*; draw *wz* parallel to *V'L'*, the vanishing line; draw *ew* parallel to *yo*; make *pz* equal to *pw*; through *w* draw *st*, tending to the centre *C'* of the picture, cutting *oD'* in *t*; and through *x* draw *qr*, tending also to *C'*, cutting *oD'* at *r*; draw *rs* and *qt* parallel to *V'L'*, and *sqr* will be the representation of the circumscribing square; then complete the circle as in method 3.

Method 4. Plate IV. Fig. 1.

Let *ABCD* be the representation of the circumscribing square, with two sides of the original parallel to the intersecting line, consequently the other two perpendicular thereto; and let *GH* be the representation of a diameter parallel to the intersecting line, and *I* that of the centre; *EF* the diameter perpendicular to the intersecting line. Divide *IH* into any number of equal parts (as three), and through the points of division (1, 2,) draw the lines *Fm, Fn*; draw *HK* parallel to *FE*, cutting *AB* at *K*; divide *KH* into the same number of equal parts as *IH*, and through the points of division draw the lines *Em, En*, then the points *m* and *n* are in the curve as well as the points *E* and *H*. In the same manner, the curve *EopG*, for the representation of the other quarter, will be found; also in describing the representation *GFH* of the remote semi-circle, proceed for the representation of each quarter in the same way, only changing the points *F* and *E* for each other, and the whole curve will be obtained.

Method 5. Fig. 2.

Let *GEH* be the representation of the remote semi-circle in the same position as before. Divide *IH* into any number of equal parts (as three), also divide the line *BH* respectively to represent the original of *BH*, divided into three equal parts; that is, since *BC'* is the indefinite representation of a line *C'*, its vanishing point, *Bk* is a line drawn through *B*, and *C'd* another drawn parallel thereto, and on the contrary side of *BC'*. On *Bk* set off the distances *B1, 12, 2k*, equal to each other; join *kH*, and produce it; meet *C'd* in *t*, and draw each of the lines *1l, 2m*, tending to the point *t*, cutting *BH* at *l* and *m*, the same as in problem 15; then having drawn the lines *Epl, Eqm*, as in method 4, draw *lpE, mqE*, and the points of intersection *p* and *q* will be in the curve. In the same manner may the part *ErsG* be obtained, and also the representation of the remote half, if necessary.

Fig. 3, is the representation of a segment less than a semi-circle, the chord of the original segment being parallel to the intersecting line: the operation is the same as in method 4. It is hardly possible to conceive any method more convenient and more easy than this, as the perspective representation is found geometrically, without any other vanishing points than the centre of the picture.

Method 6. Fig. 4.

Having completed the representation, *ABCD*, of a circumscribing square, the sides of the original being parallel and perpendicular to the picture; find the perspective centre *I*, which may be done by drawing the two diagonals; find the representation *GH* of the diameter parallel, and that of *FE* of the diameter perpendicular to the picture; produce *GH* both ways to *K* and *L*, making *GK*, and *HL*, each equal to *IH* or *IG*; join *KE* and *KF*, *LE* and *LF*; also join *ED*, *FA*, *EC*, and *FB*, cutting the lines drawn from *K* and *L* to the points *E* and *F*, at *a, b, c, d*, which are points in the representation of the circle; therefore through all the points *a, E, b, H, c, F, d, G*, draw a curve which will represent the circle required.

Fig. 5, shews the same thing for the representation of a semicircle with its diameter parallel to the picture.

The methods shewn by *figs. 1, 2, 3, 4*, and *5*, are derived from the following consideration.

Let *AB* (*fig. 6*.) be any straight line cutting another *CD* at *E*, and dividing it into two equal parts *EC* and *ED*; and if *CF* and *DG* be drawn parallel to *BA*, and if *FG* be drawn through *A* parallel to *CD*; and if *CE* and

PERSPECTIVE.

and CF be divided into any equal number of parts in the same ratio from C , and lines be drawn from the points of division in CF , to the point A , and lines through the several divisions in CE from the point B to cut the former drawn to the point a , the respective intersections of every two lines will be in the curve of an ellipsis, of which CE is an ordinate, and AE an abscissa. In the same manner the opposite part of the curve may be described, and also the other portion on the opposite side of the double ordinate CD . Now to shew the truth of this: let AB (*fig. 7.*) be a diameter, and gf an ordinate; draw fe parallel to BA , and Ae parallel to gf ; divide fe and fg in the same ratio, the former in b , and the latter in k , and draw bA and Bk , and produce Bk to meet bA at C , then C is a point in the curve.

Because the triangles } $BD : Bg :: DC : gk$
 BDC and Bgk are } similar,
 And because the triangles } $AD : Ai \text{ or } eb :: DC : ib \text{ or } gf$
 ADC and Aib are } similar,
 And by construction, $eb : efor Ag :: gk : gf$
 Therefore by multiplication, } $BD \times AD : Bg \times Ag :: DC^2 : gf^2$

A well-known property of the ellipsis.
 Now in *fig. 1.* EF is a diameter, and IG, IH , ordinates at the same point I ; and as the perspective representation of a circle is the section of an oblique cone, it is an ellipsis, and as the method is the same as that now demonstrated, it is therefore founded in truth. In *fig. 3.* the same data are given. In *fig. 4.* FA divides IG into two equal parts, which have their originals also equal; and FB divides IH into two equal parts, which have their originals also equal. Again, EK divides AG into two parts, the originals of which are equal; and EL divides BH into two parts, the originals of which are equal; and since a circle can be drawn through as many points found in the same manner, this method for finding eight points in the curve is correct. The same might have been observed of *fig. 2.*; for the parts in the double ordinates IG and IH are divided equally, and the parts in AG and BH perspectivevely into parts, the originals of which are equal.

Nothing can be more expeditious, nor more convenient for practice, than the method which this principle furnishes, when it is considered that no point can be found geometrically, but by the intersections of two straight lines. Its great advantage lies in the regularity of the operation; in not distracting the eye with irregular crossings. As many points may be found as required, without the least confusion, within the compass of the circumscribing parallelogram, which is not the case with many other methods derived entirely from the principles of perspective. It may be always well applied when the curve is the representation of a circle inscribing a square, the sides of which are parallel and perpendicular to the picture.

Method 7. Fig. 9.

Let $WXYZ$ be the representation of a square circumscribing the representation of the circle required; and let AB be the representation of a diameter of the original circle perpendicular to the picture, and DC the representation of the radius parallel thereto. Bisect AB in I ; through I draw bi parallel to DC ; draw Be perpendicular to bi , cutting it in e ; draw Da parallel to Be ; with the distance Be , from the point C , describe an arc cutting bi at f ; join Cf , which produce to a ; through a and I draw mn ; then if the straight line aC be moved, so that the point a may slide

along the line mn , and the point f along bi , the extremity C will trace the representation of the circle required.

For draw ft parallel to Da , cutting DC in t .
 Then because of the similar triangles Cft and CaD } $Cf : ft :: Ca : aD$
 But because $Cf = Be$ } it will be $Be : Du :: Ii : aD$
 and $Ca = Ii$ }

Again, by the similar triangles } $Be : Du :: BI : ID$
 IBe and IDu } $BI : ID :: Ii : aD$
 Therefore by equality, } $BI^2 : ID^2 :: Ii^2 : aD^2$
 But by duplication, } $BI^2 : BI^2 - ID^2 :: Ii^2 : Ii^2 - aD^2$
 And by division, }

But $BI^2 - ID^2 = (BI + ID) \times (BI - ID) = AD \times DB$, and $aD^2 = aC^2 - DC^2 = Ii^2 - DC^2$; therefore by substitution $BI^2 : AD \times DB :: Ii^2 : DC^2$, which is a known property of the ellipsis; and as the perspective representation of a circle is an ellipsis, being the section of an oblique cone, the curve described is the true representation of the original circle, for the rays which proceed to the eye form the surface of a cone, and being cut by the picture produce an ellipsis.

In this manner an ellipsis (*fig. 8.*) may be described by a continued motion, having any two conjugate diameters bi and AB given, or a diameter and ordinate, without previously finding the two axes.

But as it is not very easy to make an ellipso-graph move freely in every position of two conjugate diameters, from the obliquity of the intersections, it may be done upon the same principle, by finding points in the curve upon the straight edge of a thick piece of paper, marking the points af and C (*fig. 9.*) upon the edge; then suppose a is first placed upon any point in the line mn , carry the other end of the slip until the point marked f fall upon bi , then mark the extremity C upon the plane of description or paper, and the point so marked will be in the representation of the circle required. In the same manner as many points will be found as will be sufficient to complete the curve with sufficient accuracy.

But as the method of describing an ellipsis by continued motion from the two axes is by much the most accurate, we shall here shew the method of finding a conjugate diameter, to a diameter or ordinate given, before we can proceed with the next method.

Lemma.—Let $ABCD$ (*fig. 10.*) be the representation of a square circumscribing the original circle, and let EF be the representation of the diameter perpendicular to the picture, kl the representation of the radius parallel to the picture, and k the representation of the centre. Bisect EF at o ; through o draw mn parallel to AB or DC ; draw Fg perpendicular to mn , cutting mn at g ; from the point l , with the distance Fg , describe an arc cutting mn at h ; draw ki parallel to Fg , and produce lh to i ; make om and on each equal to il ; then mn is the diameter conjugate to FE . This method is evident from the construction given in method 7, *fig. 9.*

Method 8. Fig. 11.

The representation $ABCD$ of a square circumscribing a circle, having its sides parallel and perpendicular to the picture, being given, to find there presentation of the circle by means of the two axes.

Find G the representation of the centre, EF the representation of the diameter perpendicular, and GH the representation of the radius parallel to the picture. Then by the preceding lemma, find the semi-conjugate diameter rv ; draw Eh perpendicular to AB ; make Eh equal to rv ;
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PERSPECTIVE.

join $r k$, and bisect it by a perpendicular $n o$, meeting $A B$ at o ; from o as a centre, with the distance $o r$ or $o k$, describe the semi-circle $p k q$, cutting $A B$ at p and q ; join $k p$ and $k q$; from k , with the distance $k E$, describe the arc $m E l$, cutting $k p$ at m , and $k q$ at l ; join $r p$ and $r q$; produce $p r$ to t , and $q r$ to w ; draw $m s$ parallel to $k r$, cutting $p r$ at s , and draw $l u$, parallel also, parallel to $k r$, cutting $r q$ at u ; then $r s$ and $r u$ are the semi-axes, as shewn by the writers on conic sections; make $r w$ equal to $r u$, and $r t$ equal to $r s$, and $u w$ and $s t$ will be the axes by which the curve may be described by means of an instrument at one continued movement, and the curve thus described will be the representation of the circle required.

Method 9. Fig. 12.

Supposing every thing given as in the last method, $P F$ being the representation of a diameter perpendicular to the picture, E that of the centre, $A B$ and $D C$ that of the sides of the square parallel to the picture, and $A D$ and $B C$ the other two sides perpendicular to the picture; draw $F X$ perpendicular to $A B$; make $F X$ equal to $A F$ or $F B$; from X , with the radius $X F$, describe an arc; draw $X N$, $X B$, $X O$, &c. meeting $A B$ at N , B , O , &c.; join $N E$, $B E$, $O E$, $F E$; make angles on the other side of $F X$ equal $F X M$, $M X L$, &c.; produce the legs to meet $A B$; from the points in $A B$ draw lines to E , and produce these lines on the other side of E ; from the points $M L K$ draw $M e$, $L b$, $K a$, &c. meeting $A B$ at c , b , a ; draw the lines $c C'$, $b C'$, $a C'$, &c., cutting the lines drawn to the centre E at f , e , d , G , and g , b , i , on the opposite side of $E G$; then F , f , e , d , G , g , b , i , are points in the curve. In the same manner points may be found in the curve on the other side of $F G$, and thus any number of points may be obtained in the representation at pleasure. This is evident; for since E is the representation of X , the lines $E N$, $E B$, $E O$, $E F$, &c. are the representations of $X N$, $X B$, $X O$, $X F$, &c. Again, $a C'$, $b C'$, $c C'$, &c. are the representations of $a K$, $b L$, $c M$, &c.; therefore the points F , f , e , d , G , &c. the intersections of these lines with the former are in the curve, for each two lines are drawn from the same common point in the circle $K L M F$, which may be looked upon as the original; thus the point M is represented by f , L by e , K by d , the extremity of the diameter parallel to $A B$ by G .

In cases of this kind, where lines radiate from a centre, in approaching the parallel diameter they frequently run out to a distance beyond the bounds of the drawing. The following remedy is very convenient; let $X m$ be a line, which if produced would not meet $A B$ within a convenient distance; from any point S in $A B$, draw $S Q$ parallel to a straight line, supposed to join the points X and E ; make $S Q$ equal to the part of the line intercepted between the line $A B$ and the point X ; make $S R$ equal to the other part, and join $R Q$; now let $X m$ meet $S Q$ in m ; draw $m u$ parallel to $Q R$, cutting $S R$ at n ; make $S o$ equal $S n$, and draw $o E$, which will be the line corresponding or representing $m X$, and thus of any other.

Method 10. Fig. 13.

Let E be the representation of the centre, $D Q$ a diameter parallel, and $F G$ a diameter perpendicular to the picture; bisect $F G$ in m ; through m draw $q p$ parallel to $D Q$; find the extremities q and p by the preceding lemma, fig. 10; join $D m$, and produce it to n ; make $m n$ equal to $m D$; join $Q m$, and produce $Q m$ to o ; make $m o$ equal to $m Q$; draw $F t$ parallel to $A H$, cutting $D n$ at y , and make $y t$ equal to $F y$; draw $F s$ parallel to $B i$, cutting $Q o$ at v ,

and make $v s$ equal $v F$; draw $G u$ parallel to $H A$, cutting $D n$ at x , and make $x u$ equal to $x G$; draw $G r$ parallel to $I B$, cutting $o Q$ at w ; make $w r$ equal to $w G$; then will the points o , u , r , n , t , s , be in the representations of the circle. For since m is the centre of the ellipsis, and D is a point of contact, $D n$ will be a diameter, it will therefore be bisected by the centre m , wherefore the point n is in the curve. Again, because Q is a point of contact, $Q o$ is a diameter, therefore $m o$ is equal to $m Q$, and therefore the point o is in the curve. Again, because D and G are points of contact, and $D n$ is a diameter; and because that $G u$ is parallel to $H A$, a tangent at D , $G u$ is a double ordinate, it is therefore bisected by $D n$ at x , therefore the point u is in the curve. By the same method of reasoning as in the case of u , it will be proved, that the points r , t , and s , are in the curve of an ellipsis, wherefore all the points q , o , u , r , n , t , s , as well as the four points of contact D , F , Q , G , are in the curve of an ellipsis; here are six additional points besides those which the circumscribing square furnishes, from the considerations only, that the centre bisects all the diameters; that if there be two tangents, and the points of contact given, and if a line pass through one of the points of contact and the centre, it will be a diameter; and if another pass from the other point of contact parallel to the tangent, at the extremity of the diameter, it will be a double ordinate; and, lastly, that all the double ordinates are bisected by the diameter.

Method 11. Fig. 14.

Let $V' L'$ be the vanishing line, and $I' N'$ the intersecting line, and let b be the point where the original circle touches the intersecting line; let $D' R'$ be the directing line, D' the point of station, or prime directing point.

Through D' draw $E' D' C'$ perpendicular to $R' D'$, cutting $V' L'$ at C' , the centre of the picture; make $D' E'$ equal to the height of the picture; and make $D' R'$ equal to $D' E'$; draw $b c$ perpendicular to $I' N'$, and make $b c$ equal to the radius of the circle; from c , with the distance $c b$, describe an arc $d b a$; draw $a e$, $c t$, and $d f$, tending to the point D' , to cut $I' N'$ at e , t , and f ; draw $c a$ perpendicular to $a e$, and $c d$ perpendicular to $d f$; draw $f l$, $t n$, and $e m$, parallel to $D' E'$; draw $d k$, $t q$, and $a e$, tending to R , to cut $I' N'$ at k , q , and s ; transfer $f k$ to $f l$ from f to i ; $t q$ to $t u$ from t to u , and $e s$ to $e m$ from e to b , and join $i b$; make $o n$ equal to $o u$; then will o be the centre, $i b$ and $u n$ conjugate diameters of the ellipsis, which will be the representation of the circle.

For since D' is the directing point of the lines $d f$, $c t$, and $a e$, these lines will have parallel representations; join $R' E'$ and $k i$, or suppose them to be joined, then $k i$ will be parallel to $R' E'$, therefore $k i$ will be the representation of the line $d k$, and because $f l$ is the representation of $f d$, their intersection i will represent the point d ; in like manner it may be shewn that the point u represents t , and the point b represents a ; but the lines $d f$ and $a e$ are tangents to the circle at the points d and a ; therefore these representations $f l$ and $e m$ are tangents to the ellipsis at i and b , and therefore $i b$ is a diameter; and because $u n$ is parallel to $f l$ and $e m$, $u n$ is a diameter conjugate to $i b$.

Method 12. Fig. 15.

This process is almost similar to the last, except that the point D' is taken in a line perpendicular to the intersection; this causes the conjugate diameter $i k$ to be parallel to the intersection, and the other, $q n$, to tend to the centre of the picture.

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PERSPECTIVE.

This method, by means of directors, furnishes conjugate diameters at once, whereas if vanishing points are only used, we have only a diameter and ordinate, or double ordinate, and consequently the other diameter, which would be conjugate to the one given, must be determined by a geometrical process. The use of the directing point is therefore much more convenient, and much more accurate in the representation of curves. The directing line is always at hand when the perspective delineation is raised from a geometrical plan instead of a perspective one.

Method 13. Plate V. Fig. 1.

Let LMJK be a square circumscribing the original circle BCDEFGHI; draw the diagonals JL and MK, cutting the circle at C, E, G, I; through the centre A draw FB parallel to MJ or LK; join GI and EC; produce MJ, GI, FB, EC, and LK, to their intersecting points n, n , &c.; find the vanishing point v^2 of the parallels of FB, and draw the indefinite representations nv, n^2v , &c.; also produce the diagonal MK to meet I'N' at x ; and find the vanishing point v of the diagonal MK; draw the indefinite representation xv^3 of the diagonal, which will cut the indefinite representations drawn to v^2 of the parallels; find the vanishing point v' of the sides JK and ML; draw lines to v' from the intersections in xv^3 , and produce these lines to cut the respective indefinite representations drawn to v^2 in the points which represent those of the circle; then a curve being drawn through the corresponding points b, c, d, e, f, g, h, i , will form the representation of the circle.

This evidently appears from the property of the circle, and the method of finding the perspective representation of a point in the original plane.

Method 14. Fig. 2.

Let A be the centre of the original circle, and let B, C, D, E, F, G, H, be points in the circumference; let E' be the place of the eye in respect of the vanishing line V'L'; draw E'C' perpendicular to V'L', cutting it in C'; make E'D' equal to the height of the picture; draw the two lines D'H and D'B tangents to the circle; draw AH perpendicular to D'H, and AB perpendicular to D'B; let the lines HD' and BD' cut IN in t, t ; from the points C, D, E, F, G, draw the lines Ct, Dt, Et, &c. tending to D', cutting the intersecting line in the points t, t , &c.; from all the points t, t, t , &c. draw lines parallel to the director D'E'; from the same points B, C, D, E, F, G, H, draw the parallels Bp, Cp, Dp, &c. cutting IN in p, p, p , &c.; find the vanishing point v of the lines Bp, Cp, Dp, &c. and join the intersecting points p, p , &c. to v , cutting tb, tc, td , &c. at b, c, d, e, f, g, h , which will be the corresponding points to B, C, D, E, F, G, H, of the original circle; draw bb , which will be a diameter. The points of the other half will therefore be found by continuing the parallel from t, t, t , &c. on the upper sides of the diameter bb , and repeating the ordinates upwards to the points i, k, l, m, n , then a curve being drawn through all the points will give the representation required, as is evident from the directing and vanishing points.

PROB. XXII. Fig. 3.

To draw the representation of a rectangle inclined to the picture, and having two of the edges perpendicular to the original plane, and consequently the other two parallel thereto, the original plane being perpendicular to the picture; the feat AB of the rectangle being given.

Produce AB to its intersecting point n ; find the vanish-

ing point v of AB, and thence the representation ab of AB; draw no perpendicular to I'N'; make ne equal to the height of the rectangle, and join ev ; now suppose the lower side to rest on the original plane, and ab will be the representation of the lower side of the rectangle; draw ad and bc parallel to ne , cutting ev at c and d , and $abcd$ is the representation of the rectangle required.

For ne is the intersection of the plane of the rectangle with the picture; and because the rectangle is perpendicular to the original plane, and the original plane perpendicular to the picture, the vertical sides of the rectangle will be parallel to the intersection ne , and consequently the representations bc and ad will be also parallel to ne ; therefore $abcd$ is the representation of the rectangle.

PROB. XXIII. Fig. 4.

To find the representation of a circle in a plane perpendicular to the original plane, the plane of the circle being inclined to the picture and the original plane perpendicular thereto; the feat AB of the plane of the circle being given on the original plane.

Find the representation $abcd$ of the circumscribing square by the preceding problem, making the sides of the square parallel and perpendicular to the original plane; then find the representation of the circle by any of the preceding methods, or bisect the intersection nf at l ; draw le perpendicular to fn ; make le equal to lf or ln ; join en and ef ; from e , with the radius el , describe the arc glh ; join ef and en , cutting the arc at g and h ; draw gk and hi parallel to el , cutting fn at k and i ; then v being the vanishing point of AB, join kv, lv, iv ; draw the diagonals ca and bd , cutting the former lines at u, w, q , and s . Then through all the points u, v, w, x, q, r, s , and t , draw a curve, which will be the representation of the circle required.

This is plain by inspecting the square circumscribing the representation of the original circle in the present figure, where the correspondence of the quarter of the square, as also that of the circle with the rectangled triangle nef , and the quadrant hg of the arc of a circle, are shewn.

The principle here used is the same as that employed in problem 21, method 2, figure 12, for finding the representation of a circle.

PROB. XXIV.

To find the representation of any rectangular prism, given its situation on the original plane.

Find the representation of the nearest angle of the base; from the point thus found draw a perpendicular; find the height of that perpendicular so as to represent the corresponding line formed by the two vertical planes of the object; from the bottom draw a line to each vanishing point; also from the top of the perpendicular draw a line again to each vanishing point; find the representations of the two remote angles of the base; from each of the points thus found draw a line parallel to the line representing the nearest vertical edge of the solid, cutting the upper line drawn to the vanishing point, and this construction will finish the representation of the prism, provided that both the base and the top are in planes on different sides of the vanishing line. If the base and top are both below the vanishing line, proceed as before, and complete the representation of the two adjoining vertical planes which form the nearest angle; then from the upper extremity of each perpendicular which forms the remote vertical areas of the object, draw a line to the vanishing point of the opposite side, which

which will complete the representation of the parallelogram, by which the top of the prism is formed.

Or in short thus; find the representation of each vertical plane which forms the front angle of the object according to problem 24, figure 3, and these planes will form the representation of the rectangular prism, provided that the planes of the base and top are on different sides of the vanishing plane; but if on the same side of the vanishing plane as the two lines nearest the vanishing line, and which run to the vanishing point, represent the nearest angle of the side next the vanishing plane, whether above or below the eye; draw a line from the remote extremity of each line to the vanishing point of the other adjoining line, which also represents the opposite side, and the quadrilateral formed by each pair of lines drawn to each vanishing point will form the representation of the plane parallel with and next to the vanishing plane.

In representing any solid situated in the original plane, it will only be necessary to produce one line of the base of the solid; by which means the height of the plane which represents the side insitting on the line produced will be ascertained by setting the height of the object on a line perpendicular to the intersecting line from the intersecting point of the side of the base, and drawing a line to the vanishing point of that line from the upper extremity, thence determining the representation of the plane insitting on the side produced; then drawing a line from each end of the line representing the arras of the two adjoining planes, will give the height of the figure representing the other adjoining plane.

In *fig. 5.* *ab c g f e* is the representation of a right prism standing upon the rectangle *A B C D*; the side *A B* is produced to *b*, and the height is set on the perpendicular from *b* to *i*; the lines *b v'* and *i v'* being drawn, give the height of the trapezoid *ab f e*, which is the representation of the side standing upon *A B*; a line being drawn from *b* and another from *f* to *v'*, gives the height of the trapezoid *b c g f*, which represents the adjoining side standing upon *B C*; and the two trapezoids *f b a e*, and *f b e g*, form the whole representation *ab c g f e* of the prism, which has *A B C D* for its base; the lines *A a*, *B b*, *C c*, drawn from the two remote angles to the point of sight *E'*, give the points *a*, *b*, *c*, upon the indefinite representations *b v'* and *b v''*; *b a* is first determined, which is the representation of the line produced; then draw the indefinite representation *b v''*, the point *e* is determined; drawing the perpendiculars *a e* and *b f*, the points *e* and *f* are determined; drawing the indefinite representation *f v''*, and drawing *c g* parallel to *b f* or *a e*, *f g* is also determined, which finishes the representation of the solid.

The prismatic solid *T* above, of the same description, is delineated by setting the height of the lowest side parallel to the vanishing plane upon *h l* from *b* to *k*, and the height of the solid itself from *k* to *l*; drawing the lines *k v'* and *l v'*; then the lines *a e* and *b f*, continued upwards to cut these lines, give the representation of the face of the solid in the same plane with *A B*; drawing lines from the point where *b f* cuts the lines *k v'* and *l v'* to *v'*, determines the adjoining face.

Any side of a solid may be produced in order to get the height, as appears by the representation *O*, which is that of a solid, the base of which is *N*; one of the remote sides being produced instead of one of the hither sides to the intersection. It is only finding the height of the line representing the corresponding arras, then completing the front parallelogram of which that arras is a side, and the other adjoining a front side, as above.

R and *S* represent right parallelepipeds with two faces parallel to the picture, and consequently the vanishing point of the horizontal lines is the centre of the picture; the side of the first comes in contact with the picture, and has therefore its representation equal and similar to the original; the principle is the same as those already described.

PROB. XXV.

To represent a pyramid, with its axis perpendicular to the original plane.

Find the representation of the base, or the front part of it, then the representation of the axis; join the apex to each point, representing the two remote angular points of the object; and that representing the nearest angle, and the two triangles thus formed, will constitute the representation of the pyramid.

In *fig. 6.* *h i k r* is the representation of a pyramid standing on *H I K L*. The height of the axis is found by drawing *M I* parallel to one side; setting the height of the pyramid on the perpendicular *I p*; drawing *p v'* and *I v''*; drawing a line from the centre, *M*, of the base to *E'*, cutting *I v'* at *s*, gives the base of the perpendicular, which being drawn to meet the indefinite representation *p v'*, gives the vertex.

The inverted pyramid is represented in the same manner. Let *A B C D* be the plan or seat of the base; then by drawing a line parallel to *A B* or *D C* from the centre of the base, to meet the intersecting line in *e*, and setting the height of the vertex from the original plane from *e* to *f*; drawing *f v'*; producing *A B* to *d*, and representing the sides *A B* and *B C*, as if the base were in the original plane; setting the height of the base, which is the uppermost side, on the perpendicular *d g*; drawing *g v'*, and the perpendiculars *a a'*, *b b'*, cutting *g v* at *a'* and *b'*; drawing *b v''* and *c c'* parallel to *b b'*, gives the two sides *b' a'* and *b' c'*, which represent the two nearest sides of the base. The representation of the seat of the centre of the base will be found by joining *e v'*, and by intersecting this line by another line from the centre of the seat of the base to the point of sight *E*; drawing a perpendicular from the intersection meeting *f v'*, gives the representation, *g*, of the meeting of the sides.

The following practical examples are derived from the preceding problems, founded on the theory of the directing plane, which theory, where a plan of the object is given, furnishes the most expeditious rules for practice, and the most easily to be comprehended. The prime director and station point are employed. The eye is only used for drawing the parallels of lines in the original object. The lines on the plan representing original vertical planes are produced to their intersecting points, and perpendiculars are raised from each such point on the intersecting line, and the height of each respective plane of the original object set thereon; these perpendiculars will be the intersections of the vertical planes of the object, and the two extremities of each perpendicular will be the intersections of lines parallel to the original plane in each vertical plane. Lines being drawn from the intersecting points of the intersecting lines of the vertical planes, to their vanishing points, gives the indefinite representation of the lines which have the said vanishing point. The prime directing point, *D'*, is used in cutting off portions from the indefinite representations, to represent original distances, which are the seats of lines parallel to the original plane given in the plan. This mode of cutting off finite portions to represent original lines is very expeditious; for by using the prime directing point, the indefinite representations of all the lines drawn on the original from all points of the plan, are perpendicular to the intersecting and vanishing lines, by the theory of the directing plane;

PERSPECTIVE.

plane; and as the vertical lines of the object are represented by vertical lines in the picture, the indefinite representations of the lines drawn to the prime directing point, forms one straight line with the representation of the perpendicular, which represents the vertical arrafes of the object. Another convenience of this method of employing the prime director and prime directing point is, that the plan of the object may be drawn on one piece of paper, the vanishing points of the sides, and the intersecting points of the lines which radiate to the station point found, and the whole may be transferred to another piece of paper, for the purpose of forming the delineation of the object. It must also be observed, that the basis of all the vertical planes which form the plan must be produced to their intersections; then proceed with the remaining part as directed above.

Curves are found by drawing two lines from each original point, and finding their indefinite representations, one by means of a vanishing point, and the other by the director and directing point, only using one directing point and vanishing point for the whole of the points so found.

Example 1. Plate VI.

Fig. 1. N^o 1. shews the representation of a house with wings by the preceding method; N^o 2 is the plan; N^o 3 the principal elevation. CD is the intersecting line of the vertical plane, insinuating upon the line AB on the plan; GH is the intersecting line of the plane of the receding part of the front, insinuating upon EF of the plan; LM is the intersection of a vertical plane, passing along the ridge of the roof, insinuating upon AI in the plan; CD is the height of the summit of the pediments, GH the height of the receding part of the elevation, and LM is the height of the ridge of the roof from the original plane or base; Mv' is the indefinite representation of the line which forms the ridge of the roof; Hv' is the indefinite representation of the top of the wall of the receding face; Dv' the indefinite representation of a line joining the tops of the pediments; and Qv' the indefinite representation of a line through the lower points of the pediment. The points n, n, which represent the summit, and r, s, t, u, which represent the bottom of the pediment, o and p, which give the representation, op, of the top of the receding plane of the front, and the points r and q, which give the representation, rq, of the ridge of the roof, represented by IA on the plan, are all found from the prime director D'E', and the prime directing point D'. The bottom part is found by drawing lines from the intersecting points, L, G, C, of the base lines of the vertical planes, which give the indefinite representations of the lines forming the base of the original object to the vanishing point: these indefinite representations to the vanishing point are cut by the parallels of the director, which limits the portions representing the lines that inclose the base of the object. The roof is formed by joining pr, oq, wq.

In the plan there are four systems of parallel lines, one parallel to each front, making two; the other two are the lines representing the hip lines of the roof. In finding the intersections of the vertical planes, only the series of parallels to AB are produced.

Example 2.

Fig. 2. N^o 1. is the representation of a house, with a bow in the middle of the front. Every thing with regard to the straight lines is found as in the preceding example; only one thing must be observed, that in the representation of the bow, or any of its intermediate horizontal sections, the intersection of each plane is found, and the intersecting points found on the intersecting line of the base plane transferred

to each intersecting line. Thus IN is the intersecting line of the base plane; and therefore the intersecting line for the representation *cddefg*, of the arc CDEFG of the circle, which represents the plan of the bow; *m, n, o, p*, are the intersecting points of a series of lines, drawn parallel to IB, the plan of the front plane; *m'n'o'p'* is the intersecting line of a plane of a section of the bow, parallel to the base of the object; *m''n''o''p''* the intersecting line of the plane of the top of the bow; *m'''n'''o'''p'''* is the intersecting line of a plane parallel to the base of the object above the level of the top of the bow, in order to shew more clearly how a section of the cylindric bow may be represented at different heights. The points are thus transferred to each of these intersections: through the intersecting point *m* of IB, in the intersecting line IN, draw the perpendicular *mm'm'm'''*; make *mm'* equal to the height of the section of the bow, *mm''* equal to the height of the top of the wall; draw the lines *m'n'o'p'*, and *m''n''o''p''*, parallel to the intersection IN, then transfer the distances of *mn, no, op*, upon *m'n', n'o', o'p'*, and *m''n'', n''o'', o''p''*; then from the points *m', n', o', p', m'', n'', o'', p''*, in each intersecting line, draw lines to the vanishing point *v'*, then the indefinite representations found by the director and directing point, will give the points in the curve, which being joined gives the representation of each curve of the bow.

N^o 3. shews the elevation of the front of the house, which therefore gives the length of the house and breadth of the bow; N^o 4. shews the elevation of the flank or end, which therefore gives the breadth of the house and the projection of the bow. Each of these elevations gives also the height of the object. By this means any arc of a circle may be represented: this is only the application of problem 21, method 14, which shews the representation of a whole circle.

Example 3. Plate VII.

Fig. 1. N^o 1. is the representation of a flight of steps with two kirbs, which are about a step higher than the top of the landing, and terminate in a plane parallel to the horizon; N^o 2 is the plan.

Find the intersection, CD, of the vertical plane passing through AB on the plan; set the height of the steps from C to D; from the extremities and several divisions of CD, draw lines to the vanishing point *v'*, which will give the indefinite representations of the horizontal lines, forming the top of each step in a section of the plane of the inside of the kirb. The vertical lines, forming the face of the risers, are represented by the intercepted part of the parallels of the director D'E'. The vanishing point of the arrafes, and internal quoins of the steps, is supposed to be out of the picture upon the vanishing line (*fig. 2.*) at *v'*: lines are then drawn through all the points, representing the section made by the inside of the kirb to the vanishing point *v'*, which gives the planes of the risers and treads. The height of the kirb might have been obtained upon CD, but is found by setting it on FG, which is the intersection of the plane of the face of the kirb, through BE upon the plan. The remaining parts of the representation to be finished is sufficiently plain by the bare inspection of the figure, and from what has been said in the preceding problems and examples.

Another very excellent method of finding the ends of the steps upon the inside of the kirb, is by finding the vanishing point of their inclination, when the vanishing point is accessible; make *v' 1*, on the vanishing line, equal to the distance, *v' E*, of the vanishing point, *v'*, from the eye *E'*: draw *v' 1* perpendicular to the vanishing line VL; make the angle *v' 1 v'* equal to PQR, N^o 3; then having obtained the point *b*, the representation of B on the plan, which

PERSPECTIVE.

which is the lower edge of the riser in the plane of the kirb, draw $b v^1$, which will be the indefinite representation of a line, touching the lines of concurrence of the internal angles in the plane of the inside of the kirb; then indefinite representations being drawn to v^1 , from all the points in $C D$, will cut the line $b v^1$; draw a perpendicular from each intersection between every two lines, from $C D$ to the vanishing point v^1 , and these perpendiculars will represent the riser on the inside of the kirb.

Example 4.

Fig. 2. $N^{\circ} 1$. represents a flight of returning steps, as shewn by the plan $N^{\circ} 2$. The diagonal plane passing through the nearest angle of the steps, is produced in order to obtain the intersection $A B$ for a line of heights. The representation of the section passing through the diagonal being found, draw lines from every point found in the said representation to each vanishing point of the sides, and the lines thus drawn are the indefinite representations of the arrases and internal quoins; the rest is completed as in the preceding examples.

Example 5.

Fig. 3. is the representation of a flight of steps, without a plan, with the top of the kirb parallel to a plane touching the nosings. Given the intersection of the plane of the riser at A ; supposing the vanishing points v^1, v^2 , to be found from the known inclination of the sides to the picture, and the vanishing point v^3 , as in the third example.

Make $A G$ equal to the distance of the intersecting point A from the nearest angle, $G H$ equal to the thickness of the kirb, $H I$ equal to the length of the steps, and $I C$ equal to the thickness of the farther kirb. Then the point 2 being the distance of the vanishing point v^2 from the eye, draw lines from the points G, H, I, C , tending to 2 , meeting $A v^2$ in k, l, m, n ; draw $k o, l p, m q$, and $n r$, perpendicular to $I' N'$. Set the height of the front part of the kirb upon the perpendicular $A B$; draw $B v^1$, cutting the perpendiculars in o, p, q, r ; draw $A v^1$; make $A E$ equal to the horizontal distance of the inclined part on the top, from the nearest point of concurrence of the lower edge of the riser, and the lower edge of the outside of the kirb; then the point 1 being the distance of the vanishing point v^1 from the eye, draw $E s$ tending to 1 , meeting $A v^1$ at s ; draw $k v^1$ and $s v^2$, meeting $k v^1$ at t ; make $E F$ equal to the whole height of the kirb; draw $s u$ parallel to $E F$, or perpendicular to $I' N'$; draw $F u$ tending to the point 1 ; draw $u v^1$; draw $t v$ perpendicular to $I' N'$, meeting $u v^1$ in v ; draw $v v^1$; make $A K$ equal to the horizontal breadth of the kirb; draw $K w$ tending to 1 , cutting $A v^1$ at w ; draw $w x$, tending to v^2 , cutting $k v^1$ at x ; draw $x y$ perpendicular to $I N$, cutting $v v^1$ at y ; and $k o v y x k$ will form the hither end of the nearest kirb. The section of the hither side of the remote kirb is completed as in the third example; having the tops $o p, q r$, of the vertical faces of the front of the kirb, the inclined surfaces may be formed by the vanishing point v^1 ; and terminated by drawing the perpendicular $v t$ to meet $o v$, tending to v^1 at v , then drawing $v v^1$. The horizontal parts at the top are found by drawing lines to v^1 , and another line to v^2 .

Example 6.

Fig. 4. $N^{\circ} 1$. shews the representation of a stair with circular steps. The principle of the method is in finding the representations of several vertical sections, all passing through the axis of a cone surfaçed, which would touch the nosings of the steps, then drawing a curve through all the corre-

sponding points of each respective nosing, will form the representation of the whole series. The sections may very easily be obtained without the use of the vanishing points, by representing the heights of each step upon the cone, and setting the heights upon each intersecting line of the plane of each section, then joining the lines from all the points in each intersecting line of heights to the respective point in the axis; then the line $D C$, on the section $N^{\circ} 2$, being drawn to touch the nosings; then $A E$ and $A B$ being produced to meet $D C$ in D and C ; with the radius $A C$, $N^{\circ} 2$, describe an arc of a circle $A B C D E$, $N^{\circ} 1$, so as to meet the two last planes which terminate the sides; find the representations a, b, c, d, e , then the axis $f f'$ of the cone being found, draw the lines $a f', b f', c f', d f', e f'$; these lines will represent the sides of the cone in each section, and consequently will represent the lines touching the nosings; then the points where these lines are cut by the lines drawn from the several points in each line of heights, to the corresponding points in the axis, gives the points in the nosings of each section; the points of concurrence for the internal angles will be found, by drawing a perpendicular from each point of representation of the nosings, to the next line, which represents a line in the plane of the vertical section, and in the plane of the tread; the distance between the foot of the perpendicular and the next lower point representing the nosings, represents the breadth of the step in the section. This, if the plane of the section $F A$ be produced so as to meet the picture in $G H$; set the heights of the steps on $G H$, draw lines from the points G and H , and also from the intermediate divisions to the corresponding points in $f f'$, gives the points a, i, k, l , in the line $a f$, representing the slant side of the cone in that section; then drawing the perpendiculars, $i m, k n, l o$, represent the sections of the risers, and $i n, k o$, represent the heads. The points a, b, c, d, e , of the curve representing the corresponding points A, B, C, D, E , of the intersection of lines in the curved surface of the cone with the horizontal plane, will be found by the directing point D .

Fig. 6. shews the method of representing several lines, drawn to a common point of concurrence, without finding the vanishing points of these lines. The method is as follows: find c the representation of the point of concurrence C ; continue all the lines which terminate in C to the intersecting line $A B$; join all the points in $A B$ to the point c , and these radiations will be the indefinite representations of the other original lines which radiate from C ; but if any of these lines should prove to be inaccessible, draw $F H$ parallel to $C c$, cutting $A B$ in F ; let $C c$ cut $A B$ in D ; make $F L$ equal to $D C$, $F E$ equal to $D c$; join $L E$; let the inaccessible lines meet $A F$ in G and H ; draw $G I$ and $H K$ parallel to $L E$, to meet $A B$ in I and K ; make $F g$ and $F h$ equal to $F I$ and $F K$; draw $h c$ and $g c$, then $h c$ and $g c$ will represent $H C$ and $G C$.

Example 7. Plate VIII.

Fig. 1. $N^{\circ} 1$. shews the elevation of a cornice, $N^{\circ} 2$. the plan, which is a square. To find the representation of the said cornice, with the one series of its vertical plates parallel, and the other perpendicular, to the picture.

Let $Y F$ be the intersecting line of the top plane, parallel to the sides $A B$ and $D C$ of the plan, $V' L'$ the vanishing line, $S Q$ the distance, and C' the centre of the picture; therefore S will be the prime director, or station point. The vertical plane of each diagonal is produced to meet the intersection at $H a$ and F ; then drawing the intersecting lines $H I$ and $F G$ of these planes, set the height of the members downwards upon each vertical intersection; then the indefinite

indefinite representations of lines in each diagonal plane parallel to the original plane, being found, draw lines to the station point S, each to cut its respective line, will give the representation of the points in each mitre, and, joining the corresponding points, will give the representations of the lines of concurrence, or those which form the arrases and internal quoins. The representation of the points in one of the mitres on the front part being found, the other will easily be determined, by drawing parallels to the intersecting line from the points ascertained, and crossing these parallels by lines drawn to the directing point from the respective points of the mitre, to be ascertained on the plan N 2; draw indefinite representations from the points representing the middle mitre towards the centre of the picture; also draw lines from F G, the intersection of the diagonal plane, through the mitres which terminate the apparent magnitude, to the vanishing point on the vanishing line of the original plane, cutting the former lines drawn to C', and the intersections will give the points to represent the third mitre, which forms the other extreme boundary of the cornice.

The indefinite representations of the heights of the mouldings in the plane of each diagonal, are necessary in order to draw the curves correctly. The vanishing point of the lines in the plane of the diagonal, through the extreme mitre of the cornice being out of reach, the line R T perpendicular to the vanishing line is taken at half the distance of the intersecting point F, from a line drawn perpendicular from the vanishing point of the lines in the plane of this diagonal. Bisection T R at K; set half the heights of the members downwards from K to L; then join the corresponding points in K L to those of F G, will give the lines representing the heights of the mouldings in the diagonal plane.

Example 8.

Fig. 2. shews the representation of a cornice inclined to the picture. The method of finding the representation of the mitres is the same as in the last example: the vanishing point of the representations of the lines of concurrence of the mouldings which appear in one of the faces is supposed to be out of reach, therefore one-third of the distance of the point M from the vanishing point is taken, and set from M to *m*; then drawing *m n* perpendicular to the vanishing line, so as to be intercepted at *n* by the said line, make *m W* one-third of *m n*. Produce the line A B, and the other lines which are parallel thereto, to their intersecting points M, I, F, D, and describe the section of the cornice M I F D E G H K L N. The line W O, parallel to the vanishing line, being supposed to correspond to M D, draw a figure W T Q O P R S U V X, so that all its dimensions may be one-third of those of the section M I F D E G H K L N, then lines being drawn from the corresponding points of each similar figure, will give the indefinite representation of the lines of concurrence of the several mouldings. The remaining parts are completed by the directing point and the other vanishing point.

This method of describing a section of the cornice with the picture is much preferable in point of accuracy to that of finding the representation of the mitre of the angle of the object, which presents itself to the eye: because when the eye is in the plane of the diagonal, the points which form the divisions of the mouldings in the mitre cannot be ascertained; or if the eye is nearly in the plane of the diagonal, the intersections will be so very oblique, as to render the perspective heights very uncertain, though the lengths of the lines representing the arrases and internal quoins may be obtained with sufficient accuracy.

Given the centre C', and the distance of the picture, the seat F, and distance of the centre of a sphere from the picture, and the radius of the sphere, to find the representation of the sphere.

Method 1. Fig. 3.

Join F C'; draw C' E' and F D perpendicular to F C', and upon contrary sides of the same; make C' E' equal to the distance of the picture, and F D equal to the distance of the centre of the sphere from its seat. On D, with the radius of the sphere, describe the circle A B G C; draw A E' and C E', tangents to the circle at A and C, cutting F C' at *o* and *k*; also draw D E', cutting *ok* in *d*; bisect *ok* in *s*; and through *s* draw *m l* perpendicular to D E', cutting C E' and A E' at *m* and *l*, and D E' at *t*; from *t*, with the distance *t m* or *t l*, describe the semicircle *m n l*; draw *s n* perpendicular to *m l*, cutting the semicircle in *n*; through *s* draw *p q* perpendicular to *ok*; make *s p* and *s q* each equal to *s n*, then *ok* is the greater, and *p q* the smaller axis of an ellipsis, which will give the representation of the sphere.

For if C' E' and F D be turned perpendicular to the plane of the picture, but on contrary sides thereof, and the circle A B C' in the same plane with F D and F C', the point E', the line *ok*, the tangents C E' and A E', and the circle A B C, will be all in one plane perpendicular to the picture: then considering A B C as a section of the sphere, E' the eye, C E' and A E' will be visual rays cutting the picture in *o* and *k*; therefore the points *o* and *k* are the representations of A and C'. Again, considering all the tangent rays around the sphere to the eye at E' as forming a cone, and the picture a cutting plane, and because the plane C E A is perpendicular to the picture, the line *ok* will be the seat of the axis of the cone, and therefore *ok* will be the transverse axis of the ellipsis. Turning the plane of the semicircle *m n l* perpendicular to D E', *m n l* will be a section of the cone parallel to its base, and *s n* will be at right angles to *ok*, and *s n* will coincide with *s p*; and since it has been demonstrated that the section of a cone cut by a plane is an ellipsis, and the perspective representation is the section of a cone of rays made by the plane of the picture, *ok* and *p q* are the axes of an ellipsis, which will represent the sphere according to the conditions given.

Method 2. Fig. 4.

Join F C'; make F D equal to the distance of the centre of the sphere from its seat, and C G on the vanishing line equal to the distance of the eye; join D G, cutting C F at *d*; draw *d g* parallel to I N; make F X on the intersecting line equal to the radius of the sphere, and join X C', cutting *d g* in *g*; then *d* is the centre, and *d g* the radius of a sphere, from which a cone of rays will proceed to the eye under the same superficies, or under the same angle as one of a radius D A or D G, *fig. 3.* placed at the distance F D, from its seat F, beyond the picture. Therefore, with the radius *d g* describe the circumference *c n a* of a circle; draw E' a and E' c tangents to the circle at *a* and *c*; produce E' a to meet F C' at *o*, and let E' c cut F C' in *k*, then *ok* is the transverse axis; bisect *ok* in *s*, draw *l m* perpendicular to D E', cutting E' a and E' c at *l* and *m*, then proceed with the remaining part of the construction, as in *fig. 3.*

PROB. XXVII. *Fig. 5.*

To make a right-angled object appear under a given angle.

PERSPECTIVE.

drawn parallel to the side, $E v'$, of the triangle $C'E v'$, the other two sides, $C'E'$ and $C'v'$, will be cut proportionally; therefore $C'H$ will be a third part of $C'v'$.

Now in the similar triangles $AD F$ and $A C'H$,
 Also in the similar triangles $AD G$ and $A C'v'$,
 Therefore by equality of ratios,

$$\left. \begin{array}{l} AD : AC' :: DF : C'H \\ AD : AC' :: DG : C'v' \end{array} \right\} DF : C'H :: DG : C'v'$$

Therefore AG produced will meet the vanishing line VL , at the point v .

PROB. XXXI. *Fig. 2.*

Given two straight lines, AB and CD , inclining to each other: to draw any number of lines through each of the given points $E, F, G, \&c.$ to tend to the same point with AB and CD .

This problem has two cases.

Case 1, fig. 2.—When all the points are in the same straight line.

Produce the straight line EFG to cut AB in B , and CD in D ; draw AC parallel to BD , cutting AB in A , and CD in C ; draw Al , making any angle with AC , and make Ab, Ai, Ak, Al , respectively equal to BE, BF, BG, BD ; divide AC in the same proportion as Al , that is, join lC , and draw ko, in, bm , parallel to lC , cutting AC at o, n, m ; draw oG, nF, mE ; then Em, Fn, Go , would meet the point of concurrence of BA and DC , as is evident from the construction.

Case 2, fig. 3.—When the points E, F, G , are not in the same straight line.

Through each of the points E, F, G , draw the straight lines PQ, RS, BD , cutting the lines AB and CD in P, Q, R, S, D, B ; draw Ab at any angle with AC , and make Ab equal to the greatest, BD of the parallel lines, and join bC ; from Ab cut off An equal to BG ; draw ng parallel to bC , cutting AC at g ; join gG . Again, from the point A , with the radius SR , describe an arc, cutting bC at i ; join iA ; from Ai cut off Am equal to SF ; draw mF parallel to bC , cutting AC in f , and join fF ; find eE in like manner; then AB, gG, fF, eE , will have the same point of concurrence, if produced.

Method 2. Case 1. Fig. 4.

Draw bm parallel to BD , and produce BA to b ; make bm equal to BD , and on bm set bl, bk, bi , respectively equal to BG, BF, BE ; join mC , and produce it to meet AB in S ; then join lS, kS, iS , cutting CA in g, f, e ; lastly, join eE, fF, gG ; then Ee, Ff, Gg , will have the same point of concurrence with BA and DC .

Case 2. Fig. 5.

Draw Tb parallel to BD , and produce BA to T ; make Tb equal to BD ; join bC , and produce bC to meet BA in S ; draw ml, nk, oi , to meet Cb in l, k, i ; through the points l, k, i , draw $lt, ku, i\sigma$, cutting AT at t, u, v ; make vr equal to YG , uq equal to XF , and tp equal to WE ; draw pS, qS, rS , cutting CA at e, f, g ; join gG, fF, eE , then will Ee, Ff, Gg , have the same point of concurrence with BA and DC .

Method 3, for both cases. Fig. 6.

When two lines, DE and DF , meeting in D , have each an inaccessible point of concurrence with a third line, VL , draw DC , making any angle with VL , cutting VL in C . In DE take any point E , and draw EA parallel to DC , cutting VL in A ; also in DF take any point F , and draw

FB parallel to DC , cutting VL in B ; divide each of the lines DC, EA , and FB , into an equal number of equal parts; then if DE and DF represent any two lines in a vertical plane, any point being given in perspective in the same plane, a line being drawn through the given point, so as to divide the corresponding part of each adjacent scale in the same proportion, will tend to the vanishing point on the one side: thus, if through the point p , laying a straight edge upon p , we find that it does not cut the corresponding points of section in the lines DC and FB , by moving it till it divide each corresponding part, on which it falls in the same proportion at g and h , then gh will tend to the vanishing point of DF . In like manner, gi may be drawn to the corresponding point at i in EA , and by this means a number of lines may be drawn in the same way to represent lines in the same vertical planes, and each two which meet in CD to represent lines in a plane parallel to the original plane.

The credit of this practical invention, as well as the following one, is due to Edward Noble.

PROB. XXXII. *Fig. 7.*

Given the vanishing line VL with its centre, and supposing the distance of the eye to be known in extension only, admitting there is a want of room to extend it to its position, to determine the vanishing points of two or more lines inclined at given angles with the intersection.

Let VL be the vanishing line, F its centre; draw FE perpendicular to VL ; make FE equal to $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$, of the distance of the picture, as the space may admit; through E draw GH parallel to EL ; draw two lines, EA and ED , meeting VL in A and D , making an equal angle with GH to those of the original lines and the intersection; on the vanishing line make Fv' the same multiple of FA that the whole distance FE' of the eye is of FE ; in like manner, make Fv'' the same multiple of FD that FE' is of FE ; and v' and v'' will be the vanishing points. In the present instance, FE is one-third of the true distance of the eye. Figure 8 is found upon similar principles to figure 7 and shews the situation of the vanishing points, by taking one-fourth of the distance of the eye; in this the angle AED is acute, the other AED , in figure 7, being a right angle. The truth of this is very easily shewn; for produce FE to E' , and join $E'v'$; then, because the sides Fv' and FE' of the triangle $v'FE'$ is divided in the same ratio at A and E , the straight line EA is parallel to $E'v'$, but the straight line EA is parallel to the original; therefore $E'v'$ is also parallel to the original; consequently, v' is found in the same place as if the parallel of the original had been drawn through the eye at E , and is therefore the vanishing point of the original line parallel to EA ; v'' may also be proved in a similar manner to be the vanishing point of original lines parallel to ED .

PROB. XXXIII. *Fig. 9.*

To find the representation of a line parallel to the original plane, in a plane perpendicular to the said plane, given the seat of the line, and its distance from its seat, without having recourse to the vanishing point, which is here supposed to be inaccessible.

Let the seat of the line be AB ; at any convenient distance draw dE' perpendicular to IN , cutting IN at E ; draw the line $E'v'$ through the eye at E'' , to meet the vanishing line in v' ; draw Ad and Bc parallel to the intersection, cutting dE' at d and c ; draw db and cg parallel to $E'v'$, cutting the intersection in g and b ;

PERSPECTIVE.

draw gq and bm perpendicular to IN ; make gn and bi equal to the height of the original line; draw lines from n and i , tending to the point v , cutting EE' at 1 and 2; draw Ae and Bf parallel to $E'v'$, cutting the intersection in e and f ; draw the lines fr and eg , tending to the vanishing point v' ; draw GH and rv perpendicular to IN ; draw $1s$ and $2w$ parallel to VL , cutting rv at s , and GH at w ; join sw , which will tend to its proper vanishing point, as required. In the same manner, the representations rG , tx , uy , vH , &c. of any series of parallel lines to the original plane in a vertical plane insisting upon AB , may be found.

PROB. XXXIV. Fig. 10.

To find the representation of a line parallel to the original plane, and in a vertical plane, the vanishing points being inaccessible as before, given the seats of the extremities of the ichnography of the line, the distance of each extremity from its seat, and the centre and distance of the picture.

Let A and G be the seats of the extremities of the ichnography. We shall here suppose the distance of the picture to exceed the limit of the vanishing line: in such cases, take one-half, one-third, or one-fourth, &c. of the distance of the picture, and take the like part of the distance of each extremity of the ichnography. In this case, let C' be the centre of the picture, and $C'D$ one-fourth of the true distance; make AI and GK one-fourth of the distance of the respective extremity of the ichnography of the line from the seats A and G ; draw AC' and CG ; draw ID , cutting AC at E ; and KD , cutting $C'G$ at G' ; join EG' , which is the representation of the ichnography of the line; draw AB and EF , $G'H$ and GD , perpendicular to IN ; make AB and GD each equal to the height of the original line; join BC' , cutting EF at F ; and DC' , cutting GH at H ; draw HF , which will be the representation of the line required. In this manner, a series of lines in a vertical plane may be found, by applying the height upon AB and GD , and joining their upper extremities to the centre C' ; then joining the corresponding points of section will give the series of lines required.

PROB. XXXV.

To find the representation of a right prismatic object, so that the original may appear under a given angle, and the extremes equally distant from the centre of the picture, given in position the right section of the object, and the vanishing line of the original plane, in which it is situated in the vanishing plane.

Let $ABCD$ (*fig. 11.*) $N^{\circ} 2$, be a section of the object; draw AB , $N^{\circ} 1$, parallel to the vanishing line $N^{\circ} 2$; bisect AB in D ; draw CD perpendicular to AB ; make the angles BAC and ABC , $N^{\circ} 1$, each equal to half the supplement of the given angle; through A , $N^{\circ} 2$, draw AE' parallel to AC , $N^{\circ} 1$; and through C , $N^{\circ} 2$, draw CE' parallel to BC ; then it is evident that the angle $A'E'C$, $N^{\circ} 2$, is equal to the angle ACB , $N^{\circ} 1$; therefore the object, or its right section $ABCD$, will appear to an eye at E under the angle required. Now, suppose the object to be represented to be a house, and $ABCD$ the plan, or horizontal section, made by the vanishing plane; and let the dimensions of the plan, for the sake of conveniency in saving room, be half of those of the real object. Let $N^{\circ} 3$ be an elevation of the front to the full size. In $N^{\circ} 2$, draw $E'v'$ and $E'v'$, cutting VL in v' and v'' . In VL make $v'1$ equal to vE' , and $v''2$ equal $v'E'$; produce the side AB to meet VL in e ; draw Bf tending to the point E' , cutting VL at f ;

draw $E'C'$ perpendicular to VL , cutting it in C ; and this will be a preparation for drawing the representation of the object as follows.

Take any convenient line VL , $N^{\circ} 4$, for the vanishing line, and place thereon double the distances $C'v'$, $C'2$, $C'f$, $C'1$, $C'e$, and $C'v''$, $N^{\circ} 2$, as shewn by smaller characters at the corresponding points; then, in $N^{\circ} 4$, v' is the vanishing point for the horizontal lines of the one side of the object, and v'' that for those of the other side of the object; 1 is the dividing point for the lines tending to v' , and 2 for the lines tending to v'' , and f the point through which the representation of the angle of the building passes; through f draw yn perpendicular to VL , meeting IN in y ; make yA double of fe , $N^{\circ} 2$; draw $A'v'$, $N^{\circ} 4$, cutting yn at o ; draw AB parallel to yn ; make AB equal to the height of the elevation $N^{\circ} 3$; join $B'v'$, cutting yn at n ; then on is the representation of the angular line of the object. Join $1o$, and produce it to meet IN at g ; make gb equal to the length of the front, $N^{\circ} 3$; place on gb the intermediate divisions of the doors and windows; from the point b , from the intermediate divisions, draw lines tending to 1, cutting ov' ; from the points of section draw perpendiculars, which will terminate the breadths of the windows and door; from the point o draw oe , tending to the dividing point 2; make ex equal to the breadth of the building; join ov'' , and draw xq , tending to 2, cutting ov'' at q ; draw qp parallel to on ; also draw nv'' , cutting qp at p ; then $onqp$ is the representation of the flank of the building; set the heights of the apertures on AB , and draw lines to v' , which will complete the representation of the openings of the windows and door, and that of the entire object. If, by setting the measures upon the base line, they should give the intersections very oblique, produce AB to C , and draw CD parallel to VL , apply the measures to CD ; divide CE , then drop the perpendiculars.

This is the first time that a rule has been shewn for representing a right prismatic object, so that the original will appear under a given angle; and to fix the object at a given distance, with the plane of the picture at the same time. This also gives a rule for making the length of the picture, and the distance of the eye from its centre in a given ratio; for AB , $N^{\circ} 1$, being made equal to any distance or length, the perpendicular DC may be made in any proportion to AB . This method finds the position of the object, so as to give the most perfect representation possible, for the picture in the position here found will be the nearest to a spheric surface; the plane of the picture being considered as tanging the spheric surface at the middle of its length.

In the method hitherto used for finding the position of an object, the plan was first drawn; the point of view was moved on the paper until it came into what was thought an agreeable position for the view; then two lines were drawn to the eye from those two points of the object which would form the greatest angle; the angle of view was bisected, and a line was drawn through such a point of the bisecting line as would make the picture, as might be thought, of sufficient dimensions. But in taking the position of the picture in this way, the proportion of the length of the picture to its distance was only guessed at, nor could the object be viewed under a given angle.

It must also be noticed here, that the method of finding the representation, as is to be found in all previous writers on perspective, without the geometrical plane of the object, does not give its position.

PROB. XXXVI. Plate X. Fig. 1.

To find the representation of a rectangular solid, by making

PERSPECTIVE.

PROB. XXXVII. *Fig. 2.*

ing the centre of the picture the only dividing point for both sides of the object.

Let the object proposed to be represented be a house, *fig. 1*; $N^{\circ} 1$, the elevation; $N^{\circ} 2$, the ground plan: let $N^{\circ} 3$, for want of room, be a reduced plan to one-third of the dimensions of $N^{\circ} 1$ and $N^{\circ} 2$, shewing the preparation necessary for the perspective representation: besides what was shewn in the preparation of the vanishing points in the preceding problem, the following will also be necessary. From the remote angular points B and D of the plan $N^{\circ} 3$, draw BH and DI perpendicular to $V'L'$; and from the hither angular point A draw HI parallel to $V'L'$; draw any two parallel lines *ai* and *gk*, $N^{\circ} 5$; in *ai* apply AD from *a* to *d*, and in *gk* apply AI from *g* to *e*; join *ag* and *de*, and produce *ag* and *de* to meet each other in *f*; upon the line *ai* place the scale of the building; join *if*, cutting *gk* in *k*; divide *gk* into a scale in the same proportion to *ai*; in *gf* take any point *s*, and draw *su* parallel to *gk*; in *ai* make *abe* equal to AB, $N^{\circ} 3$; in *su* make *st* equal to HA, $N^{\circ} 3$; join *bt*, and produce it to *m*; join also *mi*, cutting *su* in *u*; divide *su* into a scale of the same proportion with *ai*; take the triple measures in the vanishing line $V'L'$, $N^{\circ} 3$, and transfer them to the vanishing line $V'L'$, $N^{\circ} 6$. In $N^{\circ} 6$, draw any line $I'N'$ for an intersecting line. In $N^{\circ} 3$, produce DA to meet $V'L'$ in G, and take the triple multiple of CG, and extend it in $V'L'$, $N^{\circ} 6$; from C to G, through G, draw *gF* perpendicular to VL, cutting $I'N'$ at F; set *Ga* downwards, equal to the height of the eye; place the height of the apertures from *a*, as also the height of the wall upon *ag*, upwards; from the points of section in *ag*, draw the indefinite representation of the horizontal lines of the building to the vanishing point v' ; draw *f v'*; produce $E'C'$, $N^{\circ} 3$, to meet HI in X; in $N^{\circ} 6$, draw *Cx* perpendicular to $I'N'$, meeting $I'N'$ at *x*; set the triple measures of XH, $N^{\circ} 3$, from *x* to *r*, $N^{\circ} 6$; now as the point *r* is found, which begins with the remote extremity of the end of the house, take the measures of the end of the house, and reduce them from the natural to the cofinal scale, and repeat each half from *r* to *s*, and from *s* to *b*, $N^{\circ} 6$; also take the measures of the length of the front and reduce them from the natural to the final scale, and repeat them in order from *b* to *i*, from *i* to *j*, from *j* to *k*, from *k* to *l*, from *l* to *m*, from *m* to *n*, and from *n* to *o*, $N^{\circ} 6$; draw *bI*, tending to the point C' , cutting $F v'$ at I; draw $I v'$; draw *rL*, tending to C' , cutting $I v'$ at L; draw *oK*, tending to C, cutting $F v'$ at K; then three lines, *Lw*, *Iy*, and *Kz*, being drawn from the points L, I, K, perpendicular to $V'L'$, will give the representation of the three quoins which are seen, *viz.* that of the hither angle, and those of the two remote ones; and being cut by $f v'$, gives *yz* the top of the front wall, and *y v'* being drawn, gives *yw* the level of the end; then by proceeding in the same manner with the intermediate points, will give the vertical sides of the windows, and the middle of the end, in order to ascertain the summit of the triangle which forms the apex of the roof.

The representation of the roof is thus determined; upon the intersecting line, *ag*, of the heights, make *fg* equal to the height of the roof; draw *gb*, tending to v' , cutting the perpendicular from I at *b*; draw *b v'*, cutting the vertical or perpendicular line in the middle of the end at *t*, which gives the apex of the end of the roof; draw *gq* parallel to $V'L'$; draw *tp*, tending to C' , cutting *gq* at *p*; make *pq* equal to *bo*; join $t v'$ gives the representation of the ridge of the roof; draw *qu*, tending to C, cutting $t v'$ at *u*, gives the representation of the other end of the ridge; then joining *ty*, *tw*, and *uz*, completes the representation of the roof.

To put a right rectangular prismatic object in perspective by one dividing point only, and by using the same measures for both sides of the object.

Let ABCD be the plan of the object, E' the point of sight, $V'L'$ the vanishing line, as before; draw the parallels E'E, and EG of the sides of the object; bisect the angle E'E'G by the straight line $E'd$, cutting EG in *d*, then *d* will be the dividing point in the vanishing line VL.

Let the object to be drawn be a house, as at *fig. 1*, $N^{\circ} 1$ and 2; the plan, *fig. 2*, $N^{\circ} 1$, being only one-third of the size, is used only for the purpose of ascertaining the vanishing points, the dividing point, or other particulars respecting the inaccessible vanishing point.

Draw an angle $A b B$, *fig. 2*, $N^{\circ} 2$; make *bA* to *bB* in the ratio of $G E'$ to $G d$; apply the several measures *bi*, *ij*, *jk*, *kl*, *lm*, *mn*, and *no*, *fig. 1*, $N^{\circ} 2$, to *bA*, *fig. 2*, $N^{\circ} 2$, from *b* to *i*, from *i* to *j*, from *j* to *k*, &c. Also at *fig. 2*, $N^{\circ} 3$, draw another angle $A b B$, making *bA* to *bB* in the ratio of $G E'$ to $G d$, as before, in $N^{\circ} 2$; upon the line *bA* make *bp*, *bq*, *br*, equal to *bp*, *bq*, *br*, *fig. 1*, $N^{\circ} 2$; join AB; draw rr' , qq' , pp' , parallel to AB, cutting *bB* at *r'*, *q'*, *p'*. Also in *fig. 2*, $N^{\circ} 2$, join AB, and draw ii' , jj' , kk' , &c. parallel to AB, cutting *bB* at the points *i'*, *j'*, *k'*.

Transfer the triple multiples of the several distances of VL, *fig. 2*, $N^{\circ} 1$, to VL, *fig. 2*, $N^{\circ} 4$, as shewn by the corresponding letters, except CE and CG.

Now because the surface of paper in *fig. 2*, $N^{\circ} 2$, is not sufficient to contain the vanishing points, prepare *fig. 2*, $N^{\circ} 1$, thus; draw EI and GH perpendicular to $V'L'$; make EI and GH equal to three-thirds of $C'E$, the distance of the picture; join I E' and H E'.

In $N^{\circ} 4$ *fig. 2*, draw $C'E'$ perpendicular to $V'L'$, and make $C'E$, $N^{\circ} 4$, equal to $C'E$, $N^{\circ} 1$; upon the vanishing line VL, make $C'E''$ equal to $C'E$, $N^{\circ} 1$; and $C'G$ equal to $C'G$, $N^{\circ} 1$; draw $E''I$ and GH perpendicular to $V'L'$, making $E''I$ and GH equal to EI and $G H$, $N^{\circ} 1$; join $E'I$ and $E'H$, which will tend to the vanishing points.

Let the dimensions in *fig. 1*, $N^{\circ} 1$, be applied in No. 4, *fig. 2*, to Cc , Cd , &c. in altitude upon the corner from C upwards and downwards; then draw lines tending to the vanishing points, as shewn in the preceding problems; draw any convenient line, PQ, parallel to $V'L'$; continue the corner line of the building to meet PQ in *b*; make *bi*, *bj*, *bk*, &c. also *bp*, *bq*, *br*, equal to *bi*, *bj*, *bk*, &c. *fig. 2*, $N^{\circ} 2$, and *bp'*, *bq'*, *br'*, $N^{\circ} 3$; then $C'd$ being the triple multiple of Cd , $N^{\circ} 1$, the point *d* will be the dividing point; draw *bR* and *bS* tending to the vanishing points; from the several points *ij*, *k*, &c. and *p*, *q*, *r*, draw lines tending to *d*, to cut *bR* and *bS*; from the point of section draw lines perpendicular to $V'L'$, which will give the corners of the building and the sides of the windows. Let us now suppose the walls completed with their apertures.

Now Cg being the height of the roof upon the corner of the building from the vanishing line, and the height of the left-hand corner being at *w*, draw *gv* and *wy*, tending to the vanishing point v' ; through *g* draw *ut* parallel to VL; make *gu* equal to *bo*; make *gt* and *ux* equal to the half of $b'r'$, $N^{\circ} 3$; draw *xy* and *tw*, tending to the dividing point *d*, gives the points *y* and *w* for the extremities of the ridge, the points *y* and *w* being joined to the wall heads completes the roof.

This method is entirely new, and perhaps is the easiest method of practice that has ever been devised.

PROB. XXXVIII. *Fig. 3.*

To find the representation of a hipped truncated roof, supposing

PERSPECTIVE.

posing the dimensions of the walls to be the same as in *fig. 2*, N^o 4.

Let v' and v'' be the vanishing points, of which v' is inaccessible, and let P be the dividing point, found as that of *fig. 2*, N^o 4, the positions of the other points being taken from *fig. 2*, N^o 1. Draw $I''N''$ the intersecting line of the truncated part of the roof, that is, draw $I''N''$ parallel to $V'L'$, equal to the height of the top of the roof from the level of the eye; make gk the proportional measure of the breadth of the inclined part of the roof; that is, the real measure being applied to the scale bA , *fig. 2*, N^o 2, or *fig. 2*, N^o 3, and reduced to the scale bB , gives the proportional measure. The other measures upon $I''N''$ are all supposed to be reduced in the same manner, and are consequently in the same ratio as the real measures; gh is the proportional measure of the sides of the truncated part parallel to the front, and gi the proportional measure of the end of the said part; draw kl , tending to the dividing point P, cutting gv'' at l ; draw ln , tending to the vanishing point v' ; draw gp , cutting ln at m ; draw mo , tending to the vanishing point v'' ; draw io , tending to the dividing point P, cutting mo at o ; also draw hn , tending to the dividing point P, cutting ln at n ; then the lines mn and mo represent the two visible parts of the truncated plane of the roof; join ny , mf , and or will complete the representation of the roof. This is evident, since the line ln represents the front line of the truncated part; and because that P is the vanishing point of the diagonal, the line gm is in the plane of the diagonal, and therefore the point m is properly ascertained.

Or a truncated hip roof may be thus represented: let g , *fig. 4*, be the height of the roof at the middle corner, as before; draw gq , tending to the vanishing point v' , upon the left, and gv , tending to the vanishing point, upon the right; make gh and gl equal to the breadth of the inclined part; make hi equal to the side of the truncated plane parallel, and next to the front, and make lm equal to the breadth of the truncated plane; draw lt , mu , tending to the dividing point P, cutting gv at s and u ; draw ts and ux , tending to the vanishing point on the left; draw bo and ip , tending to the dividing point P, cutting gq at o and p ; draw ox and ps , tending to the vanishing point on the right, cutting ts at s , and ox at r and x ; then rs and rx will be the two sides of the truncated flat; then joining sy , rf , and xw , will complete the whole representation of the roof.

It is somewhat strange that the base line, or intersection of the plane on which the objects are placed, is the only intersection that is to be found in treatises of perspective; but if the intersection of each plane above the eye were used, instead of describing every parallel plane upon the base, much less confusion would ensue, and much greater accuracy would be acquired. As the angles become less obtuse, that is to say, they approach the right angle by becoming more acute, all the indefinite representations would be cut more at right angles, and, therefore, the intersections would be less oblique. In order to comprehend clearly the perspective representation of polygons, it will be necessary to attend to their geometrical construction. An equilateral polygon may be constructed according to several methods; but the most eligible for the purpose of perspective is the following.

PROB. XXXIX. *Figs. 1, 2, 3, 4, 5, 6.*

The angle made by the two sides of a regular polygon being given, to construct the polygon according to a given side.

From the angular point cut off the two sides to their terminate length: then to obtain each successive side, proceed each time as in the following operation.

From the extremity of one side, which is not the angular point, draw a line parallel to the other side; from the extremity of the other side draw a line, making a given angle with that side equal to the angle of the sides of the polygon, and let the line last drawn meet the line parallel to the middle line; and three sides of the polygon will be thus determined. Proceed in the same manner with the two sides forming the last angle, and a fourth side will be obtained, and thus successively till the whole figure is inclosed.

From this geometrical description it appears, that if the vanishing points of the sides of a polygon are found, the whole may be constructed perspective.

PROB. XL.

To find the perspective representation of a polygon, given a similar figure to the polygon to be constructed, and the length of the sides.

Find the vanishing point of each of the sides, and the representation of the two sides nearest to the intersecting line.

Then repeat the following operations in finding each successive side. From the extremity of one of the representations of the two sides, which is not the angular point, draw a line to the vanishing point of the other side; then draw a line from the extremity of the other side, which is not the angular point, to the vanishing point of the next succeeding side, and the point of intersection of the two lines thus drawn will terminate the third side.

Then if the polygon be a trigon the thing is done, but if it consist of more sides the same operation must be repeated for each.

If one of the vanishing points of one of the sides be inaccessible, repeat the operations round in the same order, until one end of the inaccessible side is found; then repeat the operations in the contrary order, until the other end of the inaccessible line is found; then join the two points, which will complete the perspective representation of the polygon.

With regard to finding the vanishing points. If the polygon has an even number of sides, there will be only vanishing points for half the number of sides; but if the number of sides be odd, every side will have a vanishing point; should the number of sides be even, each radial may be marked with the digits 1, 2, 3, &c. then marked again with the same digits added to half the number of sides of the polygon. Thus, if the figure be a hexagon, as $ABCDEF A$, *fig. 2*, N^o 1; the figure, N^o 2, having all its radials parallel, has its radials numbered 1, 2, 3, and again 4, 5, 6, because the three lines continue the succeeding numbers. This is also manifested in *fig. 4*, N^o 1 and 2. In N^o 2, the radials are numbered 1, 2, 3, 4, then 5, 6, 7, 8, repeated upon the same lines, and thus every radial gives the vanishing points of two sides, as is indicated by the numbers. But if the number of sides of the polygon be odd, the numbers are repeated upon every second radial, then again upon the intermediate radials, beginning with that which lies between the first and second, as *figs. 1, 3, and 5*, plainly shew.

Fig. 6. shews the representation of a hexagon upon the foregoing principles; the sides ef and ek are first found by the vanishing points v^{1+4} and v^{3+6} , which are the first and last sides of the polygon, then drawing kg to the vanishing point v^{1+4} of the side ef , and from f drawing fg to the next vanishing point v^{2+5} in succession, gives the next side fg ; gb is found in the same manner.

Fig. 7. is another example of the principle; where the number of sides are even, the figure represented is an octagon. It will be observed in this as well as in *fig. 6*, that every vanishing point serves for two opposite sides, so that

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PERSPECTIVE.

in every half number of sides in going round from any side, the last will have the same vanishing point again as that side; or in any number of adjoining sides which consist of one more than half the number of sides in the whole polygon, the first and last of these sides will have the same vanishing point; and thus in the hexagon the vanishing points v', v^2, v^3, v^4 , are respectively the vanishing points of the opposite sides, which in order would be v^1, v^2, v^3 , and are therefore marked $v^{1+3}, v^{2+3}, v^{1+6}$. The same is to be understood of *fig. 7*.

PROB. XLII. *Fig. 8.*

Given the centre and distance of the picture, the intersecting and vanishing lines of a plane perpendicular to the picture, and the insiting line AB of a plane perpendicular to the original plane inclined to the intersection, to find the intersecting and vanishing lines of the insiting plane.

If AB do not meet the intersection $I'N'$, produce it till it meet in B ; draw $E'C$ parallel to AB , cutting the vanishing line VL in C ; through C draw $V''L''$ perpendicular to $V'L'$, and $V''L''$ will be the vanishing line; also through B draw $I''N''$, and $I''N''$ will be the intersecting line of the plane.

For the angle $C'CE$ is equal to the angle IBA ; then when these angles are raised perpendicular to the plane of the picture, and on contrary sides of it, the planes whose intersections are $I''N''$ and $V''L''$ will be parallel to each other, and therefore their intersections $I''N''$ and $V''L''$ are also parallel to each other.

PROB. XLIII. *Fig. 9.*

Given the intersecting and vanishing lines of an original plane, the seat of a line at a given angle with the intersection, the inclination of the incumbent line and the position of the eye in respect of the vanishing line, to find the vanishing point of the line whose seat is given.

Let AB be the seat of the line given; through E' , the place of the eye, draw ED parallel to AB , cutting $V''L''$ in D' ; through D draw $V''L''$ perpendicular to $V'L'$; make DE equal to DE' ; and make the angle DEF equal to the inclination of the line to the original plane, the leg EF cutting $V''L''$ at F ; then F is the vanishing point required.

Or take any point H in $E'D$, and draw HK parallel to $V''L''$; make $E'H$ to HK as radius to the tangent of inclination of the line to the original plane; join $E'K$, and produce it to meet $V''L''$ in F . For draw DG and HI perpendicular to AB , and make HI equal to HK ; join $E'I$, and produce it to G ; then $E'H : E'D :: HI : DG$, also $EH : ED :: HK$ or $HI : DF$; therefore DF is equal to DG , consequently F is the point required.

PROB. XLIII. *Fig. 10.*

Given the vanishing line, its centre and distance, and the intersecting line of an original plane perpendicular to the picture; and the insiting line of a plane inclined to the original plane, and to the intersection at a given angle, to find the vanishing line of the incumbent plane, its centre, and distance, and also its intersecting line.

Let AC be the insiting line of the incumbent plane; produce AC to meet the intersection $I'N'$ in e ; through E' , the point of sight, draw $E'v'$, cutting the vanishing line $V'L'$ at v' ; also, through E' draw $E'v^2$ perpendicular to $E'v'$, cutting the vanishing line $V'L'$ at v^2 ; through v^2 draw $V''L''$ perpendicular to $I'N'$. In $E'v'$

take any point g , and draw gh parallel to $V''L''$; make $E'g$ to gh as radius to the tangents of the plane's inclination to the original line; that is, suppose ABC , N^2 , to be the inclination of the plane, take BA equal to Eg , N^2 ; draw AC perpendicular to BA , cutting BC in C ; then make gh , N^2 , equal AC , N^2 ; then in N^2 , join Eh , which produce to meet $V''L''$ at v^3 ; join v^3 and v' , and $v'v^3$ will be the vanishing line of the plane; through the point E in $I'N'$, draw $I''N''$, and $I''N''$ is the intersecting line; from C' , the centre of the picture, draw $C'k$ perpendicular to $v'v^3$, cutting it in i ; draw $C'f$ parallel to $v'v^3$; make $C'f$ equal to $C'E'$, and join if ; and lastly, make ik equal to if ; then i is the centre, and ik the distance, of the vanishing line required.

PROB. XLIV. *Fig. 11.*

Given the centre and distance of the picture, and the seats and distances of two points of an original line on the picture, to find the indefinite representation of the line.

Let C' be the centre of the picture, C and D the seats of the two points; join CD ; draw CA and DB perpendicular to CD ; make CA equal to the distance of the point, whose seat is C , and DB equal to the distance of the point, whose seat is D ; join AB ; produce AB and CD to meet each other in F ; draw $C'v$ parallel to CF ; and $C'E'$ perpendicular to $C'v$; make $C'E'$ equal to the distance of the picture; draw $E'v$ parallel to AF , and join vF , and vF is the indefinite representation required.

PROB. XLV. *Fig. 12.*

Given the intersecting and vanishing lines of an original plane perpendicular to the picture, the position of the eye in respect of the vanishing line, and the seats of two points of a line, and their distances, to find the indefinite representation of the line.

Let A and B be the seats of the two points, $V'L'$ the vanishing line, and $I'N'$ the intersecting line of the original plane, and E' the place of the eye; join AB , and produce it to meet the intersection $I'N'$ at e ; draw BD and AC perpendicular to Ae ; make BD equal to the height of the point, whose seat is B , and AC equal to the height of the point, whose seat is A ; draw ef perpendicular to Ae ; join CD , and produce it to f ; draw eg perpendicular to $I'N'$; make eg equal to ef ; through E draw $E'v'$ parallel to AB , cutting $V'L'$ at v' ; from $V'L'$ cut off $v'v^1$ equal to $v'E'$; make the angle $v'v^1v^2$ equal to the angle which the line AB makes with CD ; and through v^1 draw $V''L''$ perpendicular to $I'N'$, cutting $v'v^2$ at v^2 ; join v^2g , and v^2g is the indefinite representation required.

PROB. XLVI. *Fig. 13.*

Given the centre and distance of the picture, the intersecting line of an original plane, and its inclination to the picture, to find the vanishing line, its centre, and distance of the original plane.

Let AB be the intersecting line of the original plane, C the centre of the picture. Through C draw ef perpendicular to AB ; draw CD perpendicular to ef ; make CD equal to the distance of the picture; and make the angle CDE equal to the complement of the inclination of the original plane to the picture; through e draw $V'L'$ parallel to AB ; then $V'L'$ will be the vanishing line, e its centre, and De its distance, as required.

PROB. XLVII. *Fig. 14.*

Given the centre and distance of the picture, and the vanishing

PERSPECTIVE.

vanishing line of a plane, to find the vanishing point of lines perpendicular to that plane.

Let C' be the centre of the picture, $V'L'$ the vanishing line of the plane. Through C' draw $C''L''$ perpendicular to $V'L'$, cutting $V'L'$ at C'' ; draw $C'E$ perpendicular to $C''L''$, and make $C'E$ equal to the distance of the picture; join $C''E$, and make the angle $C''E\psi^2$ a right angle, and let $E\psi^2$ meet $C''L''$ in ψ^2 ; then ψ^2 is the vanishing point required.

PROB. XLVIII. *Fig. 14.*

Given the centre and distance of the picture, the vanishing line of a plane, and the vanishing point of the common intersection of the plane, whose vanishing line is given, and another plane at right angles, to find the vanishing point of the other planes. Let ψ^1 be the vanishing point of the common intersection.

Find ψ^1 , the vanishing point of lines, perpendicular to the plane, whose vanishing line is $V'L'$, and join $\psi^2\psi^1$, which is the vanishing line required.

This is easily conceived, by supposing the triangle $C''E\psi^2$ perpendicular to the plane of the picture upon the line $C''\psi^2$.

PROB. XLIX. *Fig. 14.*

Given the centre and distance of the picture, and the vanishing point of parallel lines, to find the vanishing line of planes perpendicular to the lines, whose vanishing point is given.

Let C' be the centre of the picture, ψ^2 the vanishing point of the parallel lines; join ψ^2C' , and produce ψ^2C' to C' ; draw $C'E$ perpendicular to ψ^2C' ; make $C'E$ equal to the distance of the picture; join ψ^2E ; draw $E\psi^1$ perpendicular to $E\psi^2$; through C draw $V'L$ perpendicular to ψ^2C' , and $V'L$ is the vanishing line required.

PROB. L. *Fig. 15.*

Given the centre and distance of the picture, the vanishing line of one of the planes of a rectangular prism, and the vanishing point of the common intersection of that plane and the plane of the adjoining side, to find the vanishing lines of the other two sides, their centres, and distance.

Let C be the centre of the picture, $V'L'$ the vanishing line of the plane of one side, ψ the vanishing point of the common intersection of that side with the next adjoining side.

Find the vanishing line $V''L''$, of parallel planes perpendicular to parallel lines, whose vanishing point is ψ^1 by the last problem. Produce ψ^1C to E'' , cutting $V''L''$ at C'' ; make $C''E''$ equal to $C''E$; draw CE' perpendicular to $V'L'$; let ψ^1 be the intersection of the vanishing lines $V'L'$ and $V''L''$, and consequently the vanishing point of the intersection of two adjoining sides; from ψ^1 , with the radius ψ^1E'' , describe an arc, cutting CE' at E ; join $E'\psi^1$, $E'\psi^2$, $E''\psi^2$; make the angle $\psi^1E''\psi^2$ a right angle, and let ψ^1 cut $V''L''$ at ψ'' ; join $\psi^1\psi''$ for the vanishing line $L''V''$; draw CE''' perpendicular to $V''L''$, cutting $V''L''$ at C''' ; from ψ^1 , with the radius ψ^1E' , describe an arc, cutting CE''' at E''' ; join $E'''E''$ and $E'''E''$; then $V'L'$, $V''L''$, $V'''L'''$, are the vanishing lines, C , C'' , C''' , their respective centres, and $C'E'$, $C'E''$, and $C'''E'''$, their respective distances; which might have been otherwise found by drawing right-angled triangles, making the distances of the centre of the picture, and the centre of the vanishing line, the bases, and the perpendicular at the centre of the picture equal to the distance, as shewn by the dotted triangles.

PROB. LI. *Figs. 16 and 17.*

Given the common intersection of two planes, the seat of a line in one of them, and the inclination of the line to the same plane, to find the seat of the line in the other plane, and its inclination to the same.

Let $I'N'$ be the common intersection of the two planes, AB the seat of the line; let ΛB meet the intersection $I'N'$ at A ; make the angle BAC equal to the inclination of the line; draw BC perpendicular to AB , cutting AC in C . This problem may be divided into two cases; one when the two planes are at right angles to each other, and the other when they stand oblique. In the former case, (see *fig. 16.*), draw Be perpendicular to $I'N'$, cutting it in d ; make de equal to BC , and join Ae ; draw ef perpendicular to Ae ; make ef equal to dB , and join fA ; then Ae is the seat of the line, and eAf its angle of elevation on the other plane. In the latter case, draw Bf perpendicular to Bd ; make Bf equal to BC ; make the angle Bde equal to the inclination of the planes; draw fe perpendicular to de ; make dg equal to de , and join gA ; draw gb perpendicular to gA ; make gb equal to ef , and join Ab ; then gA is the seat of the line on the other plane, and gAb the corresponding angle of elevation.

By means of this problem, whatever lines are given in position to the original plane, the position of the same lines may be found to the picture, and the representation may be found as in problem 16.

PROB. LII. *Fig. 1.*

Given the centre and distance of the picture, the vanishing line of a plane, and the vanishing point of the intersection of that plane, and another plane, and the inclination of the planes, to find the vanishing line of the other plane, and its centre and distance.

Let C' be the centre of the picture, V^2L^2 the vanishing line of a plane, ψ^1 the vanishing point of the intersection of that plane with another plane; join $C'\psi^1$; draw $C'E$ perpendicular to $C'\psi^1$; make $C'E$ equal to the distance of the picture, and join $E'\psi^1$; draw $C'D$ perpendicular to ψ^1E' , cutting ψ^1E' at D ; from $C'\psi^1$ take $C'B$ equal to $C'D$, and let $C'E'$ cut V^2L^2 at A ; produce AC to F ; make the angle ABF equal to the inclination of the planes; join ψ^1F , which gives the vanishing line V^3L^3 , as required; draw $C'E^2$ perpendicular to V^2L^2 , cutting it at C^2 ; make ψ^1E^2 equal to ψ^1E' , and join ψ^1E^2 ; also draw $C'E^3$ perpendicular to V^3L^3 , cutting V^3L^3 at C^3 ; make ψ^1E^3 equal to ψ^1E' , and join ψ^1E^3 .

PROB. LIII. *Figs. 2 and 3.*

Given the centre and distance of the picture, the representation of a line, with its vanishing point, and the indefinite representation of another, from a given point in the latter, to cut off a portion, so that the originals of the two representations shall have a given ratio.

Let C' be the centre of the picture, ψ^1 the vanishing point of one of the lines, and ψ^2 the vanishing point of the other; join ψ^1 and ψ^2 by the straight line V^2L^2 , which will be the vanishing line of their plane; draw $C'E^2$ perpendicular to V^2L^2 , cutting V^2L^2 at C^2 ; draw $C'E^1$ perpendicular to $C'E^2$; make $C'E^1$ equal to the distance of the picture, and join C^2E^1 ; make C^2E^2 equal to C^2E^1 ; join ψ^1E^1 and ψ^1E^2 ; from $\psi^1\psi^2$ take ψ^1I , equal to ψ^1E^2 ; also ψ^2I , equal to ψ^1E^1 .

This problem may be resolved into two cases; first, when the two lines meet in a point, figure 2.

Let $a\epsilon$ be the given representation, and $a\psi^2$ the indefinite representation, having respectively the vanishing points ψ^1

PERSPECTIVE.

v' and v'' ; through a draw cd parallel to $V^2 L^2$; join ie , which produce to c ; make ac to ad in the original ratio required; draw d' , cutting av'' at b , and c 1, cutting av' at e ; then ae and ad are the representations of two original lines in the ratio of ac to ab . But if the two lines do not meet at the same point as in figure 3; let ed be the representation given, v' its vanishing point, and av'' the indefinite representation of the other; through the extremity a , draw $I^2 N^2$; join $1c$ and $1d$, which produce to meet $I^2 N^2$ at f and g ; from a take ae to gf , in the ratio required; join $e2$, cutting av' at v ; then the original of ab will have to the original of cd the ratio required.

PROB. LIV. Fig. 4.

Given the centre and distance of the picture, the seat and distance of any point from the picture, and the vanishing points of several lines diverging from that point, to draw the indefinite representations, and to cut a portion from each; so that the original of the representations may be in a given ratio to each other, and to the distance of the point whose seat is given.

Let C' be the centre of the picture, v', v'', v''' , the vanishing points, and s the seat of the point of concurrence; now as any two vanishing points may be the vanishing points of two lines in the same plane, therefore join $C'v'$, and $C'v''$ will be the vanishing line of a plane, in which are the original lines, whose vanishing points are C' and v' ; draw $C'E'$ perpendicular to $C'v'$; make $C'E'$ equal to the distance of the picture, and join $E'v'$; from $C'v'$ take $C'd$ equal to $C'E'$; draw sD parallel to $C'v'$; make sD equal to the distance of the point of concurrence from the picture; join Dd and sC' , cutting each other at a , the representation of the point of concurrence from the picture; join Dd and sC' , cutting each other at a , the representation of the point of concurrence; join $a v', a v'', a v'''$, also join $v'v'', v''v'''$, then $v'v''$ will be the vanishing line of a plane, in which are the original lines, whose vanishing points are v' and v'' , and $v''v'''$ will be the vanishing line of a plane, in which are the original lines, whose vanishing points are v'' and v''' ; draw $C'E''$ perpendicular to $v'v''$, cutting $v'v''$ at C'' ; from v' , with the radius $v'E'$, describe an arc, cutting $C'E''$ at E'' ; join $v'E''$ and $v'E'$; draw aJ parallel to sD , and join $D C'$, cutting aJ at J ; draw aK parallel to $v'v''$; find aK , so that aJ may be to aK as the distance of the point of concurrence is to the original length to be taken from $a v'$; from $v'v''$ take $v'1$ equal to $v'E''$; draw $K1$, cutting av' at l . In like manner draw $C'E'''$ perpendicular to $v''v'''$, cutting $v''v'''$ at C''' ; from v'' , with the radius $v''E''$, describe an arc, cutting $C'E'''$ at E''' ; from v'' , with the distance $v'E''$, describe an arc, cutting $C'E'''$ at E''' ; join $v'E'''$; from v'' , with the distance $v''E''$, describe an arc, cutting $V^3 L^3$ at 2 ; draw aM parallel to $V^3 L^3$; make aM such that aK may be to aM as the original of aL is to the original of the distance to be taken from $a v''$; draw $M2$, cutting av'' at n ; find the point 3 in the vanishing line $V^3 L^3$, by making $v'3$ equal to $v'E''$; produce Ma to O ; find the distance aO , by making aM to aO , as the original of an to the original to be taken from $a v''$; draw $O3$, cutting av'' at p ; then will the originals of as, al, an, ap , have the ratio to each other, as aJ, aK, aM, aO , as was required.

By this means the representation of a solid angle may be found, or the sides of a pyramid may be determined; and, consequently, if one of the solid angles of a parallelepipedon is found, and the lengths of the lines that form the said angle, the whole solid may be completed, by drawing lines to the vanishing point of the side at right angles. When two or more indefinite representations have the

same vanishing line, they are in course found as usual. A distance may be cut off from any indefinite representation, which has its vanishing point that of the intersection of two original planes by the point of distance laid upon either vanishing line.

PROB. LV. Fig. 5.

Given the centre and distance of the picture, the intersecting and vanishing lines of a plane perpendicular to the picture, the side of a rectangle in the original plane, and the inclination of the plane of the rectangle to the original plane, and the distance of the nearest point to the intersecting line, to find the representation of the rectangle.

Let $V^2 L^2$ be the vanishing line, $I^2 N^2$ the intersecting line of a plane perpendicular to the picture, C' the centre, and $C'E'$ the distance put in position as usual; and let AD be the side of the rectangle on the original plane, e the seat of the nearest point A , and Ae its distance; find the representation a of the point A , and then of the straight line AD ; and let $E'v'$ be the parallel of AD ; draw $E'v'$ perpendicular to $E'v''$, and let $E'v'$ meet the vanishing line $V^2 L^2$ in v' ; through v' draw $V^2 L^2$ perpendicular to $V^2 L^2$; find the point 1 in $v'v''$, by making $v'1$ equal to $v'E'$; make the angle $v'1v''$ equal to the inclination of the plane to the original plane; join $v'v''$, that is, $V^2 L^2$, which will be the vanishing line of the plane incumbent on the original plane; draw $C'E^2 V^2 L^2$ perpendicular to $V^2 L^2$, cutting $v'v''$ at C^2 ; from v'' , with the radius $v''E'$, describe an arc, cutting $C'E^2$ at E^2 ; or upon $V^2 L^2$, as a diameter, describe a semicircle, cutting $C'E^2$ at E^2 ; then C' is the centre, and $C'E^2$ the distance of the vanishing line $V^2 L^2$, and v'', v''' the vanishing points of the sides; make the rectangle $E^2 M N O$ similar to the original figure, and alike situated; draw the diagonal $E^2 v'$, and produce it to meet the vanishing line $v'v''$ at v' ; join v' and a , which give the indefinite diagonal; draw $d v''$, cutting av at c ; draw $c v''$; produce $v''c$ to b , and join $a v'$, cutting $v''c$ at b , then $abcd$ is the representation required.

PROB. LVI. Fig. 6.

Given the centre and distance of the picture, to find the representation of a rectangle in a secondary plane, with an angle resting on the primitive or original plane; given also the intersection of the secondary and original planes, and their inclination, together with the seat and distance of the resting point.

Find m , the representation of the resting point, by means of its seat and distance, and the centre C' and distance $C'E'$ of the picture; draw $E'v'$ the parallel of the intersection, cutting $V^2 L^2$ at v' ; draw $E'v''$ perpendicular to $v'v''$, cutting $V^2 L^2$ in C'' ; on $V^2 L^2$ make $C''1$ equal to $C'E'$; through C'' draw $V^2 L^2$ perpendicular to $V^2 L^2$; make the angle $C''1v''$ equal to the inclination of the secondary plane to the primitive or original plane; let $1v''$ meet $V^2 L^2$ in v'' ; through v' and v'' draw $V^3 L^3$, which is the vanishing line of the inclined plane required to be represented; find its centre C^3 and distance $C^3 E^3$; join $v'E^3$; make the angle $v'E^3 v''$ equal to the angle which one of the sides of the object makes with the intersection of its plane and the primitive; let $E^3 v''$ meet the vanishing line $V^3 L^3$ in v'' ; also make the angle $v''E^3 v'$ equal to the angle of the original figure next to the intersection of its plane with the original plane; and let $E^3 v'$ meet $V^3 L^3$ at v' ; then the representation $mno p$ may be completed as in the last problem, fig. 5. Or proceed thus; bring the distance of the eye upon the vanishing line $V^2 L^2$ from each of the vanishing points; then 2 and 4 are the dividing points;

PERSPECTIVE.

join v' , and the representation m of the nearest corner; produce $v'm$ to i ; through i draw $I^3 N^3$ parallel to $V^3 L^3$, and $I^3 N^3$ will be the intersection of the inclined plane and the picture; through the points z and m draw $m d$, cutting the intersection in d ; make $d e$ equal to the original of the side $m p$; draw $e z$, cutting $m v^3$ at p ; also draw $q m$, and produce it to meet $I^3 N^3$ at b ; make $b c$ equal to the original of the side $m n$; draw $c q$, cutting $m v^3$ at n ; draw $n v^3$ and $p v^3$, cutting each other at o ; then $m n o p$ is the representation, as before.

PROB. LVII. *Fig. 7.*

To find the representation of the portion of a rectangular prism, cut by a plane so that two of the parallel faces will be equal trapezoids, the other two parallel faces being equal rectangles, the solid being formed like a pent-house; given the centre and distance of the picture as usual, the base of the prism on the original plane, the picture and the arrases of the object being perpendicular to the original plane.

Let $A B C D$ be the base of the solid; find its representation $m n o$ as usual, as also the vertical planes of the solids $n o b a$ and $m n a d$; on the vanishing line $V^1 L^1$ make $v^1 z$ equal $v^1 E^1$; through v^1 draw $V^2 L^2$ perpendicular to $V^1 L^1$; make the angle $v^2 z v^2$ equal to the inclination of the terminating plane, and let $z v^2$ meet $V^2 L^2$ in v^2 , which will be the vanishing point of the two inclined sides, and v^2 will be the vanishing point of the two level sides; the plane $a b c d$, being drawn according to the respective vanishing points, will complete the representation of the solid. The representation of the top might have been obtained without raising the vertical sides from the base; thus, draw $A S$ perpendicular to $V^1 L^1$, cutting $I^1 N^1$ in E ; make $E S$ equal to the height of the arras or quoin upon A ; draw $S A$ parallel to $V^1 L^1$; make $S A$ equal $E A$; then S is the seat of the top of the arras on the picture, and $S A$ its distance from the picture; find a the representation of the apex of the solid angle, having the centre and distance of the picture, and the seat S and distance $S A$ of the original of the point A ; then the vanishing line $V^3 L^3$ being found as before, produce $B A$ to meet $I^1 N^1$ at F ; draw $F G$ perpendicular to $I^1 N^1$; make $F G$ equal to the height of the front plane, and the point G will be a point in the intersection of the inclined plane with the picture; therefore draw the line $I^3 N^3$ parallel to $V^3 L^3$, and $I^3 N^3$ will be the intersection of the inclined plane; find the centre C^3 , and distance $C^3 E^3$ of the vanishing line $V^3 L^3$; join $E^3 v^3$ and $E^3 v^3$; on the vanishing line $V^3 L^3$ make $v^3 5$ equal to $v^3 E^3$, and $v^3 4$ equal to $v^3 E^3$; then $D Q$ being perpendicular to $A D$, and the angle $D A Q$ equal to the inclination of the plane, $A B$ will be the length of the side parallel to the base, and $A Q$ that of the side inclined thereto; through 5 , and the point a , draw $5 a$, which produce to meet $I^3 N^3$ at e ; in $I^3 N^3$ take $e f$ equal to $A Q$; join $f 5$, cutting $a v^3$ at d . In like manner join $4 a$, which produce to meet $I^3 N^3$ at g ; make $g b$ equal to $A B$, and join $b 4$, cutting $a v^3$ at b ; draw $b v^3$ and $d v^3$, cutting each other at c , and $a b c d$ is the representation of the upper surface, as before.

Or, instead of applying the full dimensions upon the intersecting line, draw $S Q'$ and $a G'$ parallel to $V^1 L^1$; in $V^1 L^1$ produced, take any point D' ; make $A' B'$ equal to $A B$, $A' Q'$ equal to $A Q$; draw a line through a parallel to $V^3 L^3$; join $A' D'$, $B' D'$, and $Q' D'$, cutting $a G'$ at E', F', G' ; then apply $E' F'$ and $E' G'$ from a , upon the line passing

through a , parallel to $V^1 L^1$; then cut off $a b$ and $a d$ by means of the points 4 and 5 , as before.

PROB. LVIII. *fig. 8.*

To find the representation of a rectangular prism, situated with its faces inclined to the original plane, and to the picture laying upon one of its arrases on the original plane; given the seat and distance of the nearest point of concurrence of a solid angle, the inclination of the arras of the solid in the original plane to the picture, and the inclination of one of the sides to the horizon, and the centre and distance of the picture.

Draw the horizontal line $V^1 C^1$ and $C^1 E^1$ perpendicular thereto; draw $E^1 A$ parallel to $V^1 C^1$; make the angle $A E^1 C^1$ equal to the inclination of the arras to the picture.

Find the point a , the representation of the nearest angle, by means of the centre and distance of the picture, and the seat and distance of the nearest point of concurrence of the sides.

Through C^2 draw $V^2 L^2$ perpendicular to $V^1 E^1$; now as the solid lays upon one of its arrases, two of its planes will be perpendicular to the horizon, and consequently will have their vanishing line perpendicular to the vanishing line of the horizon; therefore $V^2 L^2$ will be the vanishing line of the arrases in these perpendicular planes.

Draw $C^2 E^2$ perpendicular to $V^2 L^2$, and make $C^2 E^2$ equal to $C^2 E^1$. Through E^2 draw $G H$ parallel to $V^2 L^2$; make the angles $G E^2 v^2$ and $H E^2 v^2$ equal to the inclination of the planes to the horizon, then v^2 and v^1 will be the vanishing point of the arrases, which terminate the ends that are perpendicular to the horizon.

Find v^2 the vanishing point of original lines, perpendicular to original planes, whose vanishing line is $V^2 L^2$.

Cut off $a b$, $a d$, and $a f$, as in problem 54, *fig. 4*; then lines being drawn to the respective vanishing points will complete the solid.

N^1 shews the method of reducing the proportions according to what was shewn in the last problem, by applying the measures at once to the nearest angle.

PROB. LIX. *Fig. 9.*

To find the representation of a rectangular solid; given the centre and distance of the picture, the inclination of one of the faces of the solid to the picture; which have the nearest point of concurrence, and the seat and distance of the nearest point of concurrence.

Find $V^2 L^2$ the vanishing line of the plane of the two planes of the solid, whose inclination is given; also the centre C^2 , and the distance $C^2 E^2$ of the vanishing line.

Draw $G H$ parallel to $V^2 L^2$; make the angles $G E^2 v^1$ and $H E^2 v^1$ equal to the angles which the arrases make, with a line parallel to the picture at their point of concurrence in the same plane, and $v^1 v^1$ in $V^2 L^2$ will be the vanishing points of the arrases of the two sides, whose inclinations are given.

Find the vanishing point v^1 of original lines perpendicular to planes which have $V^2 L^2$ for their vanishing line.

Find f the representation of the nearest point of concurrence of three arrases.

From each of the indefinite representations cut off the different sides, and the solid will be completed, as in the last example.

PROB. LX. *Fig. 10.*

The centre and distance of the picture, and the intersection of an original plane, making a given angle with the picture, being given, to find the representation of a wedge,

with

with the point of concurrence of three of the arrafes in the picture, the base of the object being in the plane whose intersection is given, three of the sides of the solid perpendicular to the original plane.

Let $I^1 N^1$ be the intersection of the original plane, a the point of concurrence of the nearest angle in the intersection $I^1 N^1$.

Find the vanishing line, $V^1 L^1$, of the original plane, whose intersection is $I^1 N^1$, as also its centre C^1 , and distance $C^1 E^1$.

Find the vanishing point, v^1 , of the intersection of the inclined side of the wedge, with the original plane, and draw the indefinite representation av^1 .

Find the vanishing point, v^2 , of the other side; the vanishing points, v^1, v^2 , being in the vanishing line $V^1 L^1$.

Find the vanishing point, v^3 , of original lines, perpendicular to original planes, which have $V^2 L^2$ for their vanishing line.

Join the vanishing points v^1 and v^2 , and produce $v^1 v^2$ to v^3 .

Find the centre C^1 , and distance $C^1 E^1$, of the vanishing line $v^1 v^2$, that is of $V^1 L^1$; join $v^1 E^1$.

On the radials $E^1 v^1$ and $E^1 v^2$, make $E^1 G$ and $E^1 F$ in the ratio of the sides, which have $V^1 L^1$ for their vanishing line; join GF ; draw $E^1 v^3$ parallel to GF , and v^1 will be the vanishing point of the two inclined arrafes.

Find the representations, ab and ac , of the hither sides of the base. Join av^1 and bv^1 ; join $v^1 c$, which produce to meet the indefinite representation av^1 in d ; join $d v^1$, cutting bv^1 at e , which completes the entire solid.

By joining $v^1 v^2$, $V^3 L^3$ will be the vanishing line of the inclined plane $abcd$; and by finding the centre C^1 , and distance $C^1 E^1$, and joining $E^1 v^1$ and $E^1 v^2$, the original proportion of the inclined plane may be found, by drawing the diagonal ac , and producing it to meet the vanishing line $V^3 L^3$ at v^3 , and joining $v^3 E^1$; then the rectangle $KLME^1$, whose other sides meet the radial $v^3 E^1$ in L , is the original of the inclined plane: and thus any figure may be drawn in the original plane, whose vanishing line is $V^3 L^3$.

The principles of light and shade will be treated under the article SHADOWS.

The writers on perspective are very numerous. The following, (some of whom have been already mentioned in the brief history of the science at the commencement of this article,) are the principal, with the dates of their performances, as near as can be ascertained.

Guido Ubalduis, 1600, Latin, folio; Bernard Lamy, 1701, 8vo.; s'Gravefande, 1711, 8vo., translated into English by Stone, 1724; Marolois, Vredeman Frieze, the Jesuit, 4to.; Pozzo, folio. The Jesuit was translated into English by E. Chambers, 1726. Ozanam's Mathematics contain also a treatise on Perspective. These are all foreign works. The following list contains all, or nearly all, the English authors, or their works, that have written on perspective.

Humphry Ditton, 1712, 8vo.; Moxon, folio; Brook Taylor, two treatises, one in 1715, and the other in 1719, both 8vo.; Langley, 1730, 4to.; Oakley's Magazine of Architecture, Perspective, and Sculpture, 1730, folio; Halfpenny, 1731; Hamilton, 1738, folio; Dr. Brook Taylor's Method of Perspective, by Kirby, 1754, letter-press, 4to., and plates, folio; Sirigatti by Ware, 1754, folio; Kirby's Parallel suppressed; Kirby's Perspective of Architecture, 1760, large folio; Highmore, 1763, 4to.; Fournier, 1764, 4to.; Cowley's Moveable Schemes for illustrating the Principles of Perspective, 1765, 4to.; Ferguson, 1765, 8vo.; Ware's Complete Body of Architecture contains a treatise on Perspective, 1768, folio; Priestley, 1770, 8vo.; Edward Noble, 1771, 8vo.; Thomas Malton, 1775, folio; Bradberry; Shiraton in his Cabinet

and Upholsterer's Drawing-Book, 4to.; Wood of Edinburgh, 1797, 8vo.; the Painter's Maulllick by James Malton, 1800, 4to.; Douglas, 1805, letter-press, 8vo., and plates, folio; Edwards, 1806, 4to.; Thomas Noble, second edition, 1809, 4to.; Wood's Lectures, London, second edition, 1809, 4to.; W. Daniel, 1810, final 8vo. for children; a thin quarto without the name of the author, the title being "A new Treatise on Perspective, founded on the simplest Principles, containing universal Rules for drawing the Representation of any Object on a vertical Plane," 1810, thin 4to.; D. Cresswell, A.M., 1811, 8vo.; Milne in his Elements of Architecture, 1812, 4to.; and Mr. Hayter, 1813, 8vo. Besides the above authors and treatises are Muller, Martin, and Emerson, who have written octavo treatises in their mathematical courses. A thin quarto was written by Bardwell, a painter. The Artists' Repository, published by C. Taylor, Hatton Garden, contains also an article on perspective.

But of all the above works, or authors' works, Dr. Brook Taylor's is the most celebrated, on account of the universality of his principles in their application to planes and objects. For though vanishing points in every position were known to Guido Ubalduis, and s'Gravefande not only understood the use of vanishing points, but the use of directors also in the representation of a point, anterior to the appearance of any thing published by Brook Taylor; but Brook Taylor has extended his theory not only to vanishing points, but to the vanishing lines of planes in every situation, which, when once ascertained, the representation of an object is found by the same means in each plane, and consequently with the same facility. Hamilton seems to be the first writer who introduced the practice of setting the radial, or parallel of the original line from the vanishing point, upon the vanishing line, and the original line from the intersecting point upon the intersecting line, in order to ascertain the representation of any point, or any part or parts of the original line, and to find the originals from the representations given. (See problems 8 and 9, book ii. sect. 2, of his Stereography, and the following corollaries from problem 8.) This author is the first who has applied the harmonical division of lines to perspective. Noble's Perspective contains several inventions: his methods of drawing indefinite representations to inaccessible vanishing points, both by scales and other means, are new. Thomas Malton's treatise on this subject is an able performance. His theory is well arranged, and demonstrated with true geometrical spirit. The choice of his examples in the component parts of architecture, before uniting the whole into a complete edifice, are excellent.

The works on perspective of the following gentlemen, among the authors already enumerated, are performed strictly upon the principles of Dr. Brook Taylor: Hamilton, Kirby, Highmore, Fournier, Priestley, Noble, Thomas Malton, J. Wood, Edwards, J. G. Wood, Cresswell, A.M.

Though Mr. James Malton pretends to unite the principles of Dr. Brook Taylor with those of Vignola and Sirigatti, he might have referred them with more propriety to s'Gravefande's invention of directors, as the use of the station point, which is only a directing point, can be more easily explained upon the principles of the directing line, director, and directing point, than by any mechanical notion; so that the methods which he uses may be referred entirely to the principles of Dr. Brook Taylor. In the method used in James Malton's Perspective, every point of an object in the original plane is found in the picture, by a line drawn between the intersecting and vanishing point, or drawn from some point already found, and the vanishing point, and an-

other line drawn by the directing point and the director: for when the director of an original line coincides with the intersection of the vertical plane, the representations directed will be perpendicular to the intersection, or to the vanishing line; therefore, lines thus drawn in the picture will fall in the same straight lines with original lines parallel to the picture, and to the vertical plane, insisting upon the remote extremities of the lines drawn to the directing point. This, therefore, admits of the plan of the object either being connected with the picture, or separated from it, as convenience may require. This circumstance has even been overlooked in the more excellent treatise of the father of the gentleman, upon whose work the remarks are now made.

It is something remarkable, that in Brook Taylor's Perspective, he no where directs the radial to be placed upon the vanishing line, except in problem 10, in verse perspective, notwithstanding the very near affinity shewn in problems 3, and 4, which one would have thought might have led to that application; particularly, considering the great use which Kirby, Highmore, Fournier, Priestley, E. Noble, Thomas Malton, J. Wood, Edwards, and others of inferior note, have made of it, in representing original measures without the use of the plan. It is to be observed, that in Brook Taylor's Perspective, when he finds the representation of an original figure without the plan, he first finds the representation of a side of the figure; then the representation of a line, whose original will make an angle of the figure with the original side of the projection given; then determines the proportion of the last line, found by supposing the two sides to be joined by a third line, making a triangle; then finds the vanishing point of the third side. He then proceeds with another side; if more than three, in the same manner; so that he supposes the original figure divided into triangles, by drawing diagonals, and constructs angles at the eye, equal to those which he supposes the originals to have; then finds the vanishing points of the sides, and of the diagonals; and, by drawing the successive lines to the respective vanishing points, completes the whole representation. Or, he finds the projection of each triangle, if more than one, in the succession which they adjoin each other, until the whole representation is completed. Now, by placing the length of the radials upon the vanishing line, the originals may be represented, without supposing the figure to be resolved into triangles. But what is still more to be wondered at, in respect to Brook Taylor, in problem 10, of the edition 1719, the intersection of a plane, its vanishing line, with the centre and distance of the vanishing line, are given, to find only the length of the original of a projection given, which is a problem in inverse perspective; he absolutely sets the length of the radial on the vanishing line: and had he done so, in finding the representations of original figures, he would have been the sole inventor of the practice, without the use of the ground plan, or the figure to be represented being placed in its true situation.

PERSPECTIVE is also used for a kind of picture or painting, frequently seen in gardens: and at the ends of galleries; designed expressly to deceive the sight by representing the continuation of an alley, a building, landscape, or the like.

PERSPECTIVE, *Aerial*, is sometimes used as a general denomination for that which more restrictedly is called aerial perspective, or the art of giving a due diminution or degradation to the strength of light, shade, and colours of objects; according to their different distances, the quantity of light which falls upon them, and the medium through which they are seen; the *chiaro-scuro*, or *clair-obscur*, which consists in expressing the different degrees of light,

shade, and colour of bodies, arising from their own shape, and the position of their parts with respect to the eye and neighbouring objects, whereby their light or colours are affected; and *keeping*, which is the observance of a due proportion in the general light and colouring of the whole picture; so that no light or colour in one part may be too bright or strong for another. A painter who would succeed in aerial perspective, ought carefully to study the effects which distance, or different degrees or colours of light have on each particular original colour, to know how its hue or strength is changed in the several circumstances that occur, and to represent it accordingly. As all objects in a picture take their measures in proportion to those placed in the front, so in aerial perspective, the strength of light, and the brightness of the colours of objects close to the picture, must serve as a measure, with respect to which all the same colours at several distances must have a proportional degradation in like circumstances.

PERSPECTIVE, *Alley in*. See ALLEY.

PERSPECTIVE, *Architecture in*. See ARCHITECTURE.

PERSPECTIVE, *Bird's eye view in*, is that which supposes the eye to be placed above any building, &c. as in the air, at a considerable distance from it: this is applied in drawing the representations of fortification, when it is necessary not only to exhibit one view as seen from the ground, but so much of the several buildings as the eye can possibly take in at one time from any situation. In order to this, we must suppose the eye to be removed a considerable height above the ground, and to be placed as it were in the air, so as to look down into the building like a bird that is flying. In representations of this kind, the higher the horizontal line is placed, the more of the fortification will be seen, and *vice versa*.

PERSPECTIVE, *Diagonal*. See OPERA GLASS.

PERSPECTIVE, *Graphical*. See GRAPHICAL.

PERSPECTIVE *Machine*, is a machine by which any person may delineate the true perspective figure of objects, without the help of the rules of this art. Mr. Ferguson has described a machine of this kind, the invention of which he ascribes to Dr. Bevis. The plane of this instrument, *Plate XXIV. Miscellany*, exhibited in *fig. 1*, and *fig. 2*, is a representation of it when made use of in drawing distant objects in perspective. *abef* (*fig. 1*) is an oblong square board, represented by *A B E F* in *fig. 2*; *x* and *y* (*X* and *Y*) are two hinges on which the part *cld* (*C L D*) is moveable. This part consists of two arches or portions of circles *clm* (*C L M*) and *dnl* (*D N L*), joined together at the top *l* (*L*), and at bottom to the cross bar *dc* (*D C*), to which one part of each hinge is fixed, and the other part to a flat board, half the length of the board *abef* (*A B E F*), and glued to its uppermost side. The centre of the arch *cml* is at *d*, and the centre of the arch *dnl* is at *c*.

On the outer side of the arch *dnl* is a sliding-piece *n*, (much like the nut of the quadrant of altitude belonging to a common globe,) which may be moved to any part of the arch between *d* and *l*: and there is such another slider, *o*, on the arch *cml*, which may be set to any part between *c* and *l*. A thread *cpn* (*C P N*) is stretched tight from the centre *c* (*C*) to the slider *n* (*N*), and such another thread is stretched from the centre *d* (*D*) to the slider *o* (*O*); the ends of the threads being fastened to these centres and sliders.

Now it is plain, that by moving these sliders on their respective arches, the intersection *p* (*P*) of the threads may be brought to any point of the open space within the arches. In the groove *k* (*K*) is a straight sliding bar *i* (*I*),

which may be drawn farther out, or pushed farther in, at pleasure.

To the outer end of this bar I (*fig. 2.*) is fixed the upright piece H Z, in which is a groove for receiving the sliding-piece Q. In this slider is a small hole *r* for the eye to look through in using the machine: and there is a long slit in H Z, to let the hole *r* be seen through when the eye is placed behind it at any height of the hole above the level of the bar I.

In delineating a perspective representation, *e. gr.* of the house, *qsrp*, a great way off, place the machine on a steady table, with the end E F of the horizontal board, A B E F, toward the house, so that when the Gothic-like arch D L C is set upright, the middle part of the open space (about P) within it may be even with the house when you place your eye on Z, and look at the house through the small hole *r*. Then fix the corners of a square piece of paper with four wafers on the surface of that half of the horizontal board which is nearest the house; and all is ready for drawing.

Set the arch upright, as in the figure; which it will be when it comes to the perpendicular side *t* of the upright piece *st*, fixed to the horizontal board behind D. Then place your eye at Z, and look through the hole *r* at any point of the house, as *q*, and move the sliders N and O till you bring the intersection of the threads at P directly between your eye and the point *q*; then put down the arch flat upon the paper on the board, as at S T, and the intersection of the threads will be at W. Mark the point W on the paper with the dot of a black lead pencil, and set the arch upright again, as before: then look through the hole *r*, and move the sliders N and O till the intersection of the threads comes between your eye and any other point of the house, as *p*: then put down the arch again to the paper, and make a pencil mark thereon at the intersection of the threads, and draw a line from that mark to the former one at W; which line will be a true perspective representation of the corner *p'q* of the house.

Proceed in the same manner, by bringing the intersection of the threads successively between your eye and the other points of the outlines of the house, as *r*, *s*, &c. and put down the arch to mark the like points on the paper at the intersection of the threads: then connect these points by straight lines, which will be the perspective outlines of the house. In like manner find the points of the corners of the door and windows, top of the house, chimnies, &c. and draw the finishing lines from point to point: then shade the whole, making the lights and shades as you see them on the house itself, and you will have a true perspective figure of it. Great care must be taken, during the whole time, that the position of the machine be not shifted on the table; and to prevent such an inconvenience, the table should be very strong and steady, and the machine fixed to it, either by screws or clamps.

In the same way, a landscape, or any number of objects within the field of a view through the arch, may be delineated, by finding a sufficient number of perspective points on the paper, and connecting them by straight or curved lines as they appear to the eye.

The arch ought to be at least a foot wide at bottom, that the eye at Z may have a large field of view through it; and the eye should then be, at least, $10\frac{1}{2}$ inches from the intersection of the threads at P when the arch is set upright. For if it be nearer, the boundaries of view at the sides near the foot of the arch will subtend an angle at Z of more than sixty degrees, which will not only strain the

eye, but will also cause the outermost parts of the drawing to have a disagreeable appearance. To avoid this, it will be proper to draw back the sliding bar I, till Z be $14\frac{1}{2}$ inches distant from P; and then the whole field of view, through the foot-wide arch, will not subtend an angle to the eye at Z of more than forty-five degrees; which will give a more easy and pleasant view, not only of all the objects themselves, but also of their representations on the paper whereon they are delineated. So that, whatever the width of the arch be, the distance of the eye from it should be in this proportion: as 12 is to the width of the arch, so is $14\frac{1}{2}$ to the distance of the eye (at Z) from it.

If a pane of glass, laid over with gum water, be fixed into the arch, and set upright when dry, a person who looks through the hole *r* may delineate the objects upon the glass which he sees at a distance through and beyond it, and then transfer the delineation to a paper put upon the glass. Ferguson's Perspective, chap. iii.

Mr. Kirby has also contrived and described an instrument that will be useful in taking extensive views, &c. The ruler A B (*fig. 3.*) is 19 inches long, and is graduated into 19 equal parts; it has a dove-tail groove on its upper edge to receive the perpendicular ruler G, which has one end fitted to it, so as to slide very easily; this ruler is 14 inches long, and is divided into 14 equal parts, and upon the back side of it F is a line drawn exactly in the middle, to which is fixed a silken line with a small plummet at the end. The ruler A B is fixed by two screws *a, c*, to two pieces of thin brass; and these pieces of brass are fixed at the other ends by two screws *d, e*, to a stronger piece of brass *bf*, which goes close to the ruler A B, and has a joint at X turning upon a screw: below this joint is a piece of round brass about six inches long, which goes into a hole made in the top of the staff, and may be raised higher or lower, by means of a screw *S*: C D E represents part of this staff, the whole length of which is about three feet, and at the bottom is a rank screw made of iron and fixed to the staff. H I is a wire 22 inches long, with a screw at *b* to go into the hole *b*; the piece of brass wire bent into the form *ik*, is fixed to the wire H I by the screw *k*; and the part *i* goes into the hole *f* in the brass-piece *bf*. The small wire K L is about 12 inches long, and flattened at K, at which place is a little hole above one-eighth of an inch in diameter; this wire K L is fitted to the holes *l, m, n, o*, which are made in the larger wire H I, and it may be placed higher or lower by means of a small screw. This instrument is used in the following manner: fix a paper upon a drawing board, as in *fig. 4.* and divide the paper lengthways into 19 equal parts, and perpendicularly into 14 equal parts; making these divisions greater or smaller according to your design. Then take the staff, and fix it strongly in the ground by means of a screw at bottom, and at a convenient distance from the prospect which you intend to take. After this, put the instrument together as in *fig. 5.* and fix the ruler A B exactly horizontal by means of the plummet on the perpendicular ruler and the brass joint X; then fix the wire K L, so as to have the eye-hole exactly level with the horizon or equal to the height of the eye, and take care to have the greatest distance of the eye-hole from the ruler equal to the whole length of the longest ruler A B, and never less than the distance *bl*. Having thus fixed the instrument, proceed to make the drawing; look through the eye-hole, and then move the perpendicular ruler in the groove, till you get one edge exactly against some principal object; then will the parts upon the ruler shew how high the object is from the bottom of the ruler, *i. e.* from the bottom of the picture, and you will

will also know its apparent height; therefore transfer this to the paper in those squares which correspond with the divisions upon the rulers. For the breadth of objects, move the perpendicular ruler so as to be even with the sides of an object, and the divisions upon the lower ruler will shew their apparent breadths. After the same manner, get the places and apparent sizes of as many principal objects as are necessary for assisting you, in completing the whole drawing, which may be done by this method with great exactness. When the drawing is finished, the instrument may be taken to pieces and put into a box, which may serve as a drawing board; the top M may be screwed into the staff, which will serve as a walking-stick, and the stool to sit on may be made very portable: so that every part of this apparatus may be carried by one person without any inconvenience. Kirby, *ubi supra*, b. ii. p. 65, &c.

PERSPECTIVE, *Military*, is that wherein the eye is supposed to be very remote from the table or plane. See *Bird's Eye View*, in PERSPECTIVE.

PERSPECTIVE, *Scenographic*. See SCENOGRAPHY.

PERSPECTIVE of *Shadows*. See SHADOW.

PERSPECTIVE, *Specular*, is that which represents the objects, in conical, spherical, or other mirrors, erect and clear, whereas on other planes they appear confused and irregular. See MIRROR and ANAMORPHOSIS.

PERSPICUITY, PERSPICUITAS, in *Rhetoric*, is a principal excellence of style, to which all the ornaments and beauties of speech ought to give way: as it is necessary to render a discourse intelligible, and forms one of the constituent parts of elegance. "Prima est eloquentiæ virtus perspicuitas," says Quintilian, lib. viii. cap. 2. There are three different ways in which perspicuity in a composition may be violated; *viz.* by obscurity, ambiguity, and unintelligible expression. The common sources of obscurity are some defect in the expression, arising from ellipses in language, the affectation of conciseness, or rapidity of thought in writers, or a bad choice of words; a bad arrangement of the words, so that the construction is not sufficiently clear; the use of the same word in different senses in the same sentence, an uncertain reference in pronouns and relatives: too complicated or artificial a structure of the sentence, so that the sense is too long suspended by parenthesis; the injudicious introduction of technical words and phrases; and, lastly, very long sentences. Ambiguity may be occasioned either by using some expression which is equivocal, or by ranging the words in such an order that the construction is rendered equivocal. The last fault proceeds either from great confusion of thought, which is commonly accompanied with intricacy of expression, or from affectation of excellence in the diction, evidenced by the injudicious use of figures, or from a total want of meaning. In these several ways, a speaker may express himself obscurely, and so convey his meaning imperfectly to the mind of the hearer; or express himself ambiguously, and so, along with his own, convey a meaning entirely different; or express himself unintelligibly, and so convey no meaning at all. Dr. Campbell in his "Philosophy of Rhetoric," vol. ii. book 2, chap. 6. has well exemplified and exposed these offences against perspicuity. It is justly observed by Quintilian, *ubi supra*, that by perspicuity, care is taken, not that the hearer may understand, if he will; but that he *must* understand, whether he will or not. See STYLE.

PERSPIRATION, in *Physiology*, the office of the skin, by which it forms and discharges various matters, principally fluids, from the blood; or the matters themselves so discharged. It is distinguished into *sensible* and *insensible*, ac-

ording as it consists of fluids recognizable by the senses, or of such as escape our observation. See INTEGUMENTS.

PERSPIRATION of *Plants*, in *Vegetable Physiology*, takes place chiefly from the surface of their leaves. In order to collect the liquor perspired, it is only necessary to introduce a branch of the plant into any sufficiently capacious glass vessel; when the fluid which exudes will trickle down the sides of the glass, in great abundance, especially if the experiment be made in sun-shine. The liquor thus obtained is of a clear watery nature, scarcely distinguishable to our senses, or to our chemical enquiries, from the sap of the same plant, whatever it may be, procured by wounding its branches before the foliage expands. This, which may be termed the insensible perspiration of plants, becomes in some cases sensible; as when it runs down, like a slight shower, from Willow or Poplar trees, in hot sunny weather; or when it collects in drops on the leaves of Plantain trees in a stove. Hales and others have made experiments to ascertain the quantity of insensible perspiration in various plants. The great annual Sun-flower was found to perspire about seventeen times as much as the ordinary insensible perspiration of the human skin. The Cornelian Cherry, *Cornus mascula*, is said to discharge, in twenty-four hours, as much fluid as is equal to twice the weight of the whole shrub. Succulent leaves perspire much slower than others, though they absorb in a far more rapid proportion.

This watery perspiration is the only excrementitious discharge of the vegetable body. The sap being carried up into the leaves, where it is acted upon by air and light, for the most important purposes, yields those various and highly curious secretions, which, being carried down into the bark, afford matter for the increase of the tree, as well as for the manifestation of its various qualities. The great bulk of the sap which remains, as it does not return to the root, like the blood of animals to their heart, can be disposed of no otherwise than by a copious evaporation. Dr. Darwin was of opinion that this watery perspiration rendered a further service to the plant, by being acted upon by light, so as to give out oxygen, which was immediately absorbed by the air-vessels. But this hypothesis is inadmissible on many accounts, nor need we here repeat that which is adopted under the article LEAF.

The sensible perspiration of many plants is of a far different nature from the above watery evaporation, and is to be considered as an actual secretion. Such are the mucilaginous exudation found on the leaves of the Lime-tree, *Tilia europæa*; the saccharine matter perceptible on Orange trees, hops, beech, and other plants, which is one kind of honey-dew, and either owing to some injury to their roots, or to the sudden influence of a cold, or otherwise noxious, atmosphere. The *Cistus* genus, and many other shrubs of warm countries, afford a resinous exudation from their leaves and young twigs. The Fraxinella, *Diosmanus albus*, is very remarkable for a highly inflammable vapour, which in hot still weather issues from, and hovers around, the plant, exploding on the approach of a lighted taper. Manna is said to have been scraped from the leaves of *Fraxinus Ornus*, though usually procured only from the sap of that tree. A kind of wax may in like manner be obtained, as some report, from the leaves of Rosemary. A copious glutinous perspiration is observable on young leaves of many kinds, as the Cherry, Plum, various Poplars, and abundance of aromatic herbs. *Pelargonium inquinans* is singular for its exudation of a soft oily matter, that stains the fingers with a red or vermilion-like tinge.

PERSTAIN, in *Geography*, a town of Bohemia, in the circle of Boleslaw; 14 miles N.W. of Jung-Buntzel.

PERSUR, a town of Hindoostan, in Allahabad; 10 miles E.N.E. of Gazypour.

PERSWAR, a town of Hindoostan, in the circar of Gurrak; 15 miles S. of Mahur.

PERTABGUR, a fort of Hindoostan; 30 miles N.E. of Allahabad. N. lat. $25^{\circ} 58'$. E. long. $82^{\circ} 23'$.

PERTABPOUR, a town of Hindoostan, in Oude; 52 miles N.E. of Manickpour.—Also, a town of Hindoostan, in Bengal; 15 miles N.W. of Midnapour. N. lat. $22^{\circ} 35'$. E. long. $87^{\circ} 10'$.

PERTELS, a town of Austria; six miles N. of Bohmish Waidhofen.

PERTH, a royal borough, and the county town of Perthshire, Scotland, is situated in the middle of a verdant plain, on the western bank of the river Tay, at the distance of forty miles and a half N. by W. from Edinburgh. This plain is divided by the town into two parts, called the north and South inches, or islands, each of which measures about a mile and a half in circumference, and both are appropriated for the benefit and amusement of the inhabitants of the place.

Perth is a town of very high antiquity, and is generally allowed to have owed its origin to the celebrated Roman general Agricola, who penetrated into this part of the country about the year 70. He is said to have fixed on this spot as the site, originally of a winter camp, and afterwards of a colonial town, from the resemblance its scenery bears to that in the vicinity of ancient Rome. So striking is the similitude, indeed, that the Roman soldiers when they first saw the river Tay, and the adjacent plain, are recorded to have exclaimed with one consent, "Ecce Tiber! Ecce Campus Martius! Behold the Tiber! Behold the field of Mars." Hence the Tay was called New Tiber, by the Italians for many centuries; and Fordun, a Scottish historian gives the name of Tyber-Mere, to an extensive moor which lies west from the town. An aqueduct, said to have been constructed here by Agricola, is still in existence, and supplies the mills and wells with water. In ancient times when the town was fortified, it also supplied the ditches, by which the latter was surrounded.

Of the history of Perth during its Roman occupation, and for several centuries after the retreat of that people from Britain, nothing certain is known. Neither is it recorded at what period it became a chartered town. Alexander Necham, an English writer, who read lectures on history at Paris in 1180, described Perth as a place of great opulence. In 1210, according to the Scottish historians, it was strongly fortified by king William, who also renewed its former charters, and granted it many additional privileges. At that time Perth was reckoned the capital city of Scotland, and even at the present day it ranks inferior only to Edinburgh and Glasgow. Between the years 1201 and 1459, no fewer than fourteen great national councils were held here. During the same period, Perth was also the usual residence of the Scottish monarch, and consequently of the nobility, many of whose ancient mansions still adorn its streets. It was then likewise, as it is still, an extensive commercial town. Fordun informs us, that the merchants of Perth visited, in their own ships, the Hanse towns; and it is a part of the eulogium conferred on Alexander III., who died in 1286, that he devised successful measures for securing the trading ships of that nation against pirates, and against being detained on slight pretences in any foreign port. "In consequence of the care which he exercised about the trade of the kingdom, which, for some years during his minority had been on the decline, multitudes of ships soon came from

divers regions loaded with goods of various kinds to be exchanged for the commodities of this country."

The German merchants, or Flemings, also early frequented the port of Perth with mercantile views; and many individuals of that nation conversant in the linen and woollen manufactures, and in staining of cloth, appear to have fixed their abode in the town, and to have been received as burghesses. King William, however, following the example of his grandfather king David, put the foreign merchants of Perth under great restrictions; and to prevent the settlement of foreign manufacturers there, granted in his charter already mentioned, that the burghesses might have a merchant guild of their own, "fullers and weavers excepted."

Edward I., of England, added greatly to the importance of Perth, by increasing the strength of its fortifications, and making it the residence of his deputies. King Robert Bruce conceiving its occupation to be of signal importance to his cause, attacked this town in 1306, but was repulsed by the earl of Pembroke, who sallied out, and defeated the king at Methven. In 1311, however, Bruce renewed the attack, and after an obstinate siege of six weeks, succeeded in storming the fortifications, which he levelled with the ground. After the battle of Duplin, these were re-edified by Edward Baliol, but were soon again razed by the patriotic Scots. In 1335 king Edward III. took possession of Perth, and resided in it for a considerable period. According to the English historians, John, earl of Cornwall, brother to that monarch, died here in Oct. 1336; but they omit a singular circumstance mentioned by Fordun, which is, that he received his mortal wound from the king's own hand. In 1339 Perth stood a long siege against the regent Robert, but was taken by draining the ditch. In 1437 king James I. of Scotland was murdered at the Black Friars monastery, by Robert Graham, who wounded him in twenty-eight different places, and the queen twice, during the scuffle between them. At this period the town walls seem to have been in a state of demolition; as we find them repaired, at a very considerable expence, by king James II., from whose reign nothing of a political nature worthy of notice occurs on record, till the year 1600, when the earl of Gowrie's house here was the scene of one of the most problematical events in Scottish history. We allude to the execution of what is commonly designated the "Gowrie conspiracy," by John Ruthven, the then earl, and his brother Alexander. These two young men, according to the story published by the court, having prevailed upon king James I. to visit Perth, (on the pretence of shewing him a suspicious person whom they had apprehended,) attempted to murder him, but were foiled in the attempt, and both slain by his majesty's attendants. Upon this, the inhabitants of the town assembled round the house, threatening revenge upon the royal party, and it was with considerable difficulty they were prevailed on to disperse.

After the battle of Tibbermoor, in 1644, Perth was seized by the marquis of Montrose; and in 1651 it was taken by Cromwell, and fortified with a citadel on the South inch, capable of containing a garrison of five hundred men. In 1715 the earl of Marr, at the head of a detachment of the rebels, obtained possession of it, and occupied it as a place of arms, till after the battle of Dunblane, on Sheriffmuir, when they were dislodged by the duke of Argyle, and compelled to retreat further to the north, with the Pretender. The same party likewise held this town in 1745, when prince Charles was proclaimed king, and new magistrates were appointed. The modern prosperity of Perth may be dated from this period; for being the centre of the rebellion,

PERTH.

rebellion, it was the resort of all the disaffected from the north, during a considerable length of time. Thus its ancient activity was in some degree revived. The march and residence of the contending armies produced a market here for all sorts of goods; capital was gained by industrious persons; and advantage taken of its favourable situation to render it a place of trade. Hence it has been remarked that Perth is a singular instance of a town that owes its prosperity in a great measure to the calamities attendant on rebellion and civil war. Since that turbulent period it has increased nearly one half in extent and population.

Perth, in its municipal capacity, is a royal borough, and joins with Dundee, Forfar, Cupar of Fife, and St. Andrew's, in sending one member to parliament. It is governed by a provost, three bailies, a dean of guild, a treasurer, and nineteen counsellors, most of whom are elected from the incorporated trades. The funds of the corporation are very considerable, and of late years have been expended with great judgment in various improvements. Perth being the county town, the sheriff's-court meets here; and the lords of judicary hold a court here every six months, when they go on their circuits. The provosts have been sheriffs within the town since the time of king Robert III. They bear also the office of coroner, which office however is never exercised in Scotland.

This town, considered in reference to its buildings, is one of the handsomest in Scotland. It occupies a site which might, indeed without impropriety, be selected as the seat of government, and the emporium of commerce. The Tay, which is navigable up to the quays at common tides for sloops and small craft, and in spring tides for vessels of large burden, admits of great extension of trade. This river flows here in a direction nearly north and south; but at a short distance below Perth it turns to the westward, and is lost behind the hill of Kinnoul. Over it is a handsome bridge of ten arches, which cost about 25,000*l.* It is 906 feet 9 inches in length, and 22 in breadth, with the parapets. The piers are founded ten feet beneath the bed of the river, upon oaken and beechen piles. The architect of this magnificent structure was Mr. Smeaton. It connects Perth with Kinnoul, which is a borough of barony under the superiority of the nobleman who holds that title.

The two chief streets in Perth are called the High street and South street, both of which run from east to west, and are nearly parallel to each other. Along the side of the river runs another considerable street. The new town, which was begun in 1798, contains a circus and a terrace of very handsome appearance. This portion of Perth is situated on a plot of ground, where formerly stood the monastery of Black friars, in which James I. of Scotland was murdered, as has been already mentioned.

Among the public buildings are several worthy of attention. The town-house, which forms the eastern termination of High street, is a large well built structure, as is likewise the guildhall, which stands about the middle of the same street. Several of the incorporated trades have halls, of which that of the glovers is the most elegant. The parish church, which was formerly the property of the abbey of Dumfermline, and is a large and ancient edifice, is now separated into three divisions, called the east, middle, and west kirks; besides there is another parish church, dedicated to St. Paul, a chapel of ease, and a variety of chapels and meeting-houses appropriated to the public worship of dissenters. St. John's church is remarkable from the circumstance of the reformation in Scotland having first publicly broke out here, on the 11th of May 1550, when John Knox preached a sermon against idolatry, after which the priest

being imprudent enough to display his images and relics, he was attacked by the audience, who broke the images in pieces, tore the pictures, overthrew the altars, and entirely defaced every implement of Catholic superstition in the church. This done, they proceeded to the different monasteries in the town and its neighbourhood, and pillaged or demolished the whole of them.

The chief institutions in Perth of a public nature are a grammar-school, an academy, and a literary and antiquarian society. The grammar-school has long been regarded as one of the best in Scotland. Many celebrated statesmen and scholars have received the early part of their education here; and, among others, the admirable Crichton, and the late celebrated and excellent William, earl of Mansfield. The academy is of much more recent establishment than the school, having been commenced about the year 1761. It is, however, in a very flourishing condition, and is usually attended by from eighty to a hundred students, who are instructed in various branches of learning. The literary and antiquarian society was founded 16th December, 1784. Belonging to this institution is a general library, besides a large collection of rare books, original essays, ancient manuscripts, coins, medals, and other subjects of antiquity, suitable to the design of the establishment.

Perth at present is a place of very considerable trade. There is a constant intercourse by water between Perth and London. Every four days, during the fishing season, a smack sails, and usually makes the passage within a week. A number of merchant vessels likewise frequent this port; and those of heavier burden are loaded or discharged in the river, by means of hoys. The staple manufacture of the town is linen; but the cotton trade is rapidly on the increase. The number of looms employed in the town and suburbs is estimated at about two thousand. Cotton-mills, bleach-fields, and print-fields, have been established in different situations. Leather is also one of the manufactured products of Perth; and great quantities of that article are made into boots, shoes, and gloves, for foreign consumption. From the vicinity of the Highlands, the manufacture of doe-skins and buck-skins has long been established in this town. Here is a respectable banking establishment, under the firm of the Perth Bank; besides a branch of the bank of Scotland.

Perth, according to the parliamentary returns of 1811, is divided into four parishes, and contains in the aggregate 4715 houses, and 16,948 inhabitants. The markets are well supplied with all kinds of provisions and luxuries. The annual fairs are eight in number, and are usually well attended.

Of the ancient importance of Perth, while it was a royal residence, few traces remain; with the exception of the parliament-house, and some modernized mansions of the old nobility; such as the houses of the bishop of Dunkeld, earl of Errol, and earl of Athol. The original fortrefs belonging to the town is now a ruin, and not even the scites of its monastic institutions are discoverable to the eye. Gowrie-castle, already mentioned as the residence of the earls of Gowrie, is situated on the south-east side of the town. It was built, or, perhaps more properly speaking, rebuilt, in 1520, by the countess of Huntly. After the forfeiture of the Gowrie estates, it became the property of the corporation, and was presented in 1746, by the magistrates, together with the freedom of the burgh, to William, duke of Cumberland, who afterwards sold it to the board of ordnance for the sum of 5000*l.*; and it has ever since been appropriated as barracks for a company of the royal artillery. In the pleasure-grounds attached to this house is a curious structure, called the Monk's-Tower, the origin and former

uses of which are not correctly ascertained. This structure is of an oval figure, and measures internally 24 feet by 13. The roof is very lofty, and vaulted; and on the ceiling are coarsely painted the twelve signs of the zodiac, the heathen gods and goddesses, and the arms, crest, and cyphers of the Hay family. From its style, this painting does not appear to be more ancient than the reign of Charles I; and some even think it has been executed by the same artist who painted the ceilings of the palace of Scoon: hence it is conjectured, that the tower has been erected for a banqueting-house, at that period. But others refer its origin to the 14th century, and assert that it obtained its appellation of Monk's-Tower from having been built at the expence of the monasteries of Lindores, Balmerinoch, Aberbrothick, and Coupar-in-Angus; which expence, Fordun says, "in a manner ruined these monasteries." This view of the subject is in some measure corroborated by Cant's Notes to the History of Perth, in the following lines and note:

" — The great and strong Spey Towre,
And Monk's-Towre builded round a wall of power."

"The Spey Tower is gone: it was a stately fortress, and had a strong prison. The Rosses of Craigie were governors of the fortresses. At the reformation, Robert Ross of Craigie delivered up the keys under a protestation. There remains nothing of it but a pitiful ruin, where the toll-house is. Monk's-Tower yet stands, as described in the poem, in the south-east corner of the garden, on the wall. It serves as a magazine of gunpowder for the train of artillery. The wall between this and the Spey Tower is the wall of the garden, and the fosse without still remains."

In digging the foundation of the house here, belonging to colonel Mercer of Aldie, the remains of an ancient British temple were discovered. This edifice is mentioned by Holinshed, and by Jeffrey of Monmouth; the latter of whom says, it was erected by a British king, son to Regan, the second daughter of king Lear. It was dedicated to Mars, and, as we presume, must have been of later date than the Roman invasion, as the architecture of its ruins exhibited considerable advancement in the building art.

The parish of Perth, without the town, extends about four miles in length, and three miles in breadth. The soil varies, but is extremely fertile, and well cultivated. The adjacent scenery is highly beautiful, but, owing to most of the estates here being entailed, gentlemen's seats are less numerous than otherwise might have been expected. The most remarkable houses are the Castle of Balhousie, an ancient seat of the earls of Kinnoul; the Castle of Pit-theveles, an ancient seat of the lords Oliphant; and Few-house, a seat belonging to Mr. Marshall of Hill-Cairney. The barracks, in the immediate vicinity of the town, likewise deserve to be mentioned among its ornaments. See Beauties of Scotland, Svo. vol. iv. 1801; also, A Topographical Dictionary of Scotland, by N. Carlisle, F.S.A., 2 vols. 4to. 1813.

The "five articles of Perth," so called because they were carried by the influence of the court and bishops at a convention or assembly summoned to meet at Perth Aug. 25th, 1618, are as follow: 1. That the holy sacrament should be received kneeling. 2. That ministers should be obliged to administer the sacrament in private houses to the sick, if they desired it. 3. That ministers might baptize children privately at home, in cases of necessity, only certifying it to the congregation the next Lord's day. 4. That ministers should bring such children of their parish as could say their catechism, and repeat the Lord's prayer, creed, and ten commandments, to the bishops, that they might confirm them and give them their blessing. 5. That the festivals of

Christmas, Easter, Whitsuntide, and the Ascension of our Saviour, should for the future be commemorated in the church of Scotland. The king ordered these articles to be published at the market-crosses of the several boroughs, and the ministers refused, as they were sanctioned by no penalty except the king's displeasure. The king, however, determining to obtain the ratification of parliament, issued a proclamation, commanding all ministers who opposed them, and who were preparing a supplication against them, to leave the city of Edinburgh within 20 hours. The ministers obeyed, leaving behind them a protestation against the articles, and an admonition to the members of parliament not to ratify them, as they would answer it in the day of judgment. The court interest prevailed, and the articles were ratified, contrary to the sense of the kirk and nation. This measure occasioned a persecution through the kingdom, and many of the Presbyterian ministers were fined, imprisoned, and banished by the high commission. Thus far king James proceeded towards the restitution of episcopacy in Scotland; but there was still wanting for the completion of the work a public liturgy, or book of common prayer. An insurrection through the whole kingdom being apprehended, he desisted from enforcing this unwise measure, and left it to be finished by his son, whose imposition of it upon the kirk, without consent of parliament or general assembly, set fire to the discontents of the people, which had been gathering for so many years.

PERTH-AMBOY, a city of America, in New Jersey, pleasantly situated in Middlesex county, at the head of Rariton bay, on a neck of land included between Rariton river and Arthur Kull Sound. Its site is elevated and salubrious. It lies open to Sandy-hook, and has one of the best harbours on the continent, into which vessels may enter in one side, in almost any weather. It is a port of entry and port-town; but although it is admirably situated for trade, and the legislature has given every encouragement to induce merchants to settle here, it is far from being in a flourishing state. It contains about 60 houses, and carries on a small trade to the West Indies; 35 miles S.W. of New York. N. lat. 40° 35'. W. long. 74° 50'.

PERTHSHIRE, one of the most extensive and important counties in the northern division of Scotland, is bounded on the S. by the Frith of Forth, and the counties of Stirling and Clackmannan; on the S.W. by the county of Dunbarton; on the W. and N. by Argyleshire and Invernessshire; on the N. by the latter county and Aberdeenshire; on the E. by Forfarshire; and on the S.E. by the counties of Kinross and Fife. Its greatest length from E. to W., that is, from Blairgowrie to Benloi, measures 77 miles; and its greatest breadth from the Forth at Culross on the S., to the northern extremity of Athol, is not less than 68 miles. According to the best surveys, its superficial contents are estimated at 5000 square miles; that is, 3,200,000 Scottish acres, or 4,068,640 English acres. The whole of this tract was anciently divided into the districts of Athol, Breadalbane, Rannoch, Strathearn, Balquidder, Monteith, Gowrie, Perth and Stormont, which were called stewardries, and were placed under the hereditary jurisdiction of the great proprietors of lands. These distinctions, however, are now abolished in effect, but are nevertheless still recognized in the common language of the inhabitants.

General Character of the County.—The surface of this county presents, as might be expected from its great extent, much diversity of appearance. It is naturally divided into two portions, called the Highland and the Lowland districts. The former is of bold, mountainous character, and exhibits

PERTHSHIRE.

scenes of the most rugged and romantic magnificence, while the other is finely interspersed with hill and vale, and displays all the beauties which the highest cultivation is capable of bestowing. At the foot of the Grampian hills is the fertile valley of Strathmore, which is succeeded by the no less luxuriant and extensive vale of Strathearn. The Carle of Gowrie has long been considered as the pride of Scotland in point of natural productiveness, and is certainly inferior to no portion of Great Britain in the excellence of its agricultural system. The territory along the Forth is likewise in many parts fertile and beautiful, and even the glens and declivities of the towering Grampians, and their rival Ochils, offer features of superior exuberance and of partial cultivation.

Mountains.—Perthshire is intersected by three very lofty chains of mountains; called the Grampian, the Ochil, and the Sidley or Sidlaw hills. The first are celebrated, and generally well known. They extend in a north-eastern direction, almost across the whole of Scotland, and constitute what may be termed the Highland district of this county. (See *GRAMPIAN HILLS*.) The Ochils bound the vale of Strathearn on the S., and stretch themselves through the county of Clackmannan into that of Fife. (See *OCHIL HILLS*.) The Sidley hills lie more to the N.E., and extend from the vicinity of Perth in a direction parallel to the Grampians. In all these ranges of hills, but particularly in the Grampian chain, are many summits of very great elevation. The following are among the most conspicuous for size, and perpendicular altitude above the level of the ocean.

Elevation.	Feet.
Dunfinnan hill	1040
Kinfeat hill	1179
Demyet	1345
Tortum	1400
Birnam hill	1580
Ben Clach (Ochil)	2420
Farragon	2584
Ben Chenzie (Strathearn)	2922
Ben Vorlich	3300
Ben Doig	3550
Ben Ledi	3009
Schichallion	3564
Ben Gload	3724
Ben More	3903
Ben Lawers	4015.

Mineralogy, and Mineral Products.—Considering the great extent of Perthshire, and the character of its surface, we might readily suppose it to afford abundant materials of interest to the mineralogist. This is accordingly the fact, in so far as regards scientific investigation; but in a political, or economical point of view, the minerals of this county are not of very high importance. The rock of which the Grampians chiefly consists is granite. On the southern ridges, or skirts of these mountains, however, both slate and free-stone are found in abundance; but here the great sandstone stratum of Scotland terminates, in like manner as the coal field does to the southward of the Ochils. Hence it may be remarked, that Perthshire contains within itself the boundary between the sandstone and the granite, for the former is only discovered in small patches to the north, and the latter seldom shews itself to the south, except in the mountains of Galloway. What is curious, the secondary minerals on the ridges of the Grampians, such as slate, limestone, and even sandstone, are affected in their properties by the proximity,

or intermixture of the primary rocks. Thus in the parish of Little Dunkeld, below Murphy, is an inexhaustible body of a very fine grained free-stone, which is of a light livid ash colour, and so hard as to resist the action of the atmosphere for many centuries. The cathedral of Dunkeld was built of stones from this district, and fully corroborates the above assertion. In the hills of Birnam the slate is of a very deep blue colour, bordering on violet; and the same is nearly the character of the limestone found at Rannoch, Glenlyon, Breadalbane, and the head of Strathearn. In Monteath is also a quarry of the same mineral, resembling marble, of a blue ground, with streaks of white.

Iron-stone appears in some parts of this county, but no mines of that metal have ever been opened, except on the southern side of the Ochils, about Culrofs, which, we may here observe, is the only coal district in Perthshire. A lead mine was wrought for many years near Tyndrum, in Breadalbane, as was likewise one in Glenlyon, but these are now both abandoned. Some lead ore was also discovered about twenty years back in the mountain of Ben-Ledi. One vein on the north-east side of the mountain was found to be extremely rich in silver, but its dimensions were too small to admit of its being wrought to advantage. In the hill of Birnam also, several pieces of lead ore have been dug up. This ore was encrusted with a white sparry, or rather quartzose substance. One piece, about six pounds in weight, consisted of unmixed compact ore, of a very small grain, which produced a considerable portion of pure lead, by mere roasting in a blacksmith's forge. It was found at the base of the hill, but the fissures on its summit are frequently filled with similar masses.

Slates are abundant in different portions of the county. The principal stratum commences on the borders of loch Lomond, in Dunbartonshire, and seems to terminate in the vicinity of Dunkeld. These slates are of two kinds, and called, from their colour, the blue, and the grey slates. The former, which are by far the most valuable, are plentiful in Monteath, and along the north side of the Ochils. Grey slates also are found in vast quantities in the same districts, as well as in Strathallan and Strathearn. They consist of sandstone, which may be split into thin layers, frequently six feet square, and are, since the introduction of blue slates in roofing, chiefly used for malt-kilns, floors, and pavement. In the parish of Wester Foulis is a blue slate quarry of great value, but it is not wrought to any very considerable extent, on account of its distance from water carriage.

The best quarries for free-stone in Perthshire, are those in the parish of Tulliallan on the Forth, and on the estate of Milnfield, in the south-eastern corner of the county. The former have long been held in high estimation; and were for many years wrought by a Dutch company. The latter, however, are still superior to them, and indeed may be justly reckoned the best in Scotland, if not in Great Britain. The stone from these quarries, on account of its fine quality, is commonly called Kingoody stone. It is of a greyish colour, difficult to work, and uncommonly hard and durable; so much so, indeed, that in several structures built of it four or five centuries ago, scarcely a single stone has yielded to the influence of the weather. The Milnfield quarries produce stones of all sizes, and for every purpose of building. Many of the blocks raised exceed fifty feet in height, and sixteen in breadth, and some are so thin as to be adapted for pavement, or for covering flat roofs.

In the vicinity of Drummond castle, and more especially close to Callender, that peculiar species of rock called breccia, or plum-pudding stone, is very common. It is composed of a vast variety of small rounded stones, cemented together

PERTSHIRE.

gether by a sort of brown lava. The rounded stones are of different colours, and are so firmly united, as to form one solid mass of rock, capable, when used as a building material, of withstanding the action of the atmosphere for ages. It is not, however, susceptible of being smoothed by the chisel, but admits of being dressed with the hammer. The vein of it above Callender runs in the direction of south-west and north-east, for a distance of many miles through lakes and rivers, mountains and vallies, in a line parallel with the slates and lime-stone strata, and at the distance of about a mile from each. The hill of Kinnoul, the most westerly of the Sidlaw chain of mountains, is indeed a perfect mineralogical curiosity, on account both of its peculiar structure and composition. The southern side presents a stupendous precipice of the most ragged rock, consisting of lava, in which different layers or currents are very evident. Some parts of this rock are perfectly compact; but the greater proportion of it is full of small cells, resembling those in the slag of an iron foundery. Its colour is generally of a greyish tinge, approaching to lilac. When melted, it forms a vitreous substance of a dark purple hue, so tenacious that it could easily be blown into bottles. Among the stones at the base of this hill, are frequently found very fine agates, which have fallen from the precipices above, where, by the assistance of a pocket telescope, great numbers may be seen sticking. Sulphate of barytes, rock crystal, and calcedony, also enter into the composition of this rock. Rhomboidal calcareous spar is likewise occasionally discovered here, together with a greenish coloured steatite, or soap-stone. A ridge of the last mentioned rock, about four miles in length, is found in the district of Monteth; and in the neighbourhood of Culrofs are extensive beds of fire clay.

From the intimate connection between the mineral springs of any county, and the solid mineral substances contained in its bowels, we may here mention that the most remarkable impregnated springs in Perthshire, are those of Pitkethly, which are famed for their efficacy in curing or alleviating the scrofula, scurvy, and gravel; while at the same time they give tone and vigour to the constitution. When these springs were discovered is unknown, as even tradition is silent upon the subject. They have, however, been much frequented for many years by patients from all parts of the country. See PITKETHLY.

Rivers.—Perthshire is most abundantly supplied with rivers, as various in their extent as they are diversified in scenery, and interesting from association with the events of history, or the strains of poetry. The principal among them are the Forth and the Tay, the former of which receives the Teath, the Allan, and the Devan, and the latter, the Earn, the Almond, the Lyon, and the Tummel, (which last is joined by the Garry, the Bruar, and the Tilt); also the Bran, and the united streams of the Isla, the Ericht, the Shee, the Eardle, and the Dean, all of which are justly deserving of separate notice, even in article so limited as the present. See FORTH.

The *Teath* has its source at Benharrow, near Glenfalloch. Shortly after its rise, it falls into loch Katharine, but issuing from it again at its eastern extremity, it forms loch Achray and loch Venachar. At Callender it is joined by the Balvay water, and meandering along by Lanrick and Downe castles, Blair Drummond and Ochertyre, enters the Forth near Drip. On this river is a valuable pearl fishery. See TEATH.

The *Allan* rises at Gleneagles, on the northern side of the Ochils. Its course is at once circuitous and winding, and its banks, especially from Dumblane to Lecropt, where it leaves Perthshire, exhibits some of the most beautiful scenery

of which Scotland can boast. Burns has made this river the theme of one of his finest songs.

The *Devon*, or *Dovan*, has its spring in the parish of Alva, whence it flows eastwards to the Crook of Devon, where it turns suddenly to the westward, and passing by Dollar, Tillincoutry, and Alva, pours its waters into the Forth, nearly opposite to its source, and only six miles from it, though it runs a course of about forty miles. This river is remarkable for several natural curiosities, called the Devil's mill, the Rumbling bridge, and the Cauldron Linn. The Devil's mill is formed by the water falling by a rapid descent into a basin excavated in the rock, and thence into a cavity under ground, in passing through which it is so strongly agitated by the peculiar construction of the enclosing rocks, that it emits a sound resembling that made by the movement of a large mill. The Rumbling bridge is situated about 350 yards below the mill. Here the precipitous banks of the river approach so close to each other, that an arch twenty feet span is sufficient to form the communication between them; yet the depth from the bridge to the water is upwards of eighty-six feet. It is called the Rumbling bridge, from the rumbling noise occasioned by the water falling from rock to rock in its passage through this almost hidden dingle. The Cauldron Linn is situated about a mile lower, and consists of two falls, not more than twenty-eight feet asunder. The first is thirty-four feet in height, and not more than twelve feet broad. The second fall is still higher, and between them are three round cavities, having the appearance of immense cauldrons, in the highest of which the water is in constant agitation, as if boiling, while the second is always covered with foam, and the third is uniformly calm and placid. These cauldrons are of different dimensions, the smallest being about sixteen feet, and the largest twenty-two feet in diameter. When the river is low, they are seen to communicate by apertures formed by the force of the water, through the rocks which separate them at perhaps the middle depth of the cauldron. Hence the great cauldron which communicates with the lower fall is perforated with a large opening, resembling a window, out of which the entire body of water precipitates itself over the rocks with much violence, and with a very striking and picturesque effect, particularly if viewed from below, when the sun shines on the rising vapour, and tinges it with the varied colours of the rainbow.

The *Tay*, the largest river in Scotland, has its source in the western extremity of Perthshire, in the district of Breadalbane. In its current to the German ocean, it forms two large lakes, loch Dochart and loch Tay, and terminates in an estuary equally important as the Forth. (See TAY River.) The Earn, which joins the Tay, takes its rise from a lake which bears its name near the mountain of Benvoirlich. It flows through a luxuriant tract of country, which is designated by the general appellation of Strathearn, and is bounded on one side by the Grampian, and on the others by the Ochil hills. The Almond springs from a glen in the Grampians, called the Narrow glen, and proceeding by Logie-Almond, Methven, and Rodgerton, discharges its waters into the Tay above Perth. The Lyon descends from glen Lyon, and runs a course almost as long as the Tay itself, before it loses its name by its junction with that river. The Tummel, which enters it at Logiereat, eight miles above Dunkeld, is still a longer stream, and is distinguished by a lake named loch Rannoch, and by some of the finest falls to be met with in Great Britain. In its course it is joined by the Garry, which unites the streams of the Bruar and the Tilt. All these rivers run with the usual rapidity of mountain torrents, and display, at different parts of their currents, several fine cascades, and much picturesque scenery. One

PERTHSHIRE.

of the falls of the Bruar is upwards of two hundred feet in perpendicular height, but is broken by projecting rocks into three divisions, which rather heighten, however, than diminish the grandeur of the scene. On the Garry, below its junction with the rivers above-mentioned, is the celebrated pass of Killiecrankie, near which viscount Dundee, one of the most intrepid generals of James VII. defeated the forces of king William, under general Mackay, with the loss of two thousand men, but fell himself in the action.

The next river to the north-east, that falls into the Tay, is the *Bran*, on the banks of which, at the distance of about a mile from the village of Inver, is one of the most enchanting scenes in nature. The path leading from the village is finely ornamented, and terminates in a building resembling a small temple. This structure is called Ossian's hall, or the Hermitage, but the ideas connected with either of these names are by no means applicable to it. In front is a vestibule, adorned with a picture of the aged Ossian, which being removed by sliding into the wainscot, the visitor enters an interior apartment, from the windows of which the most sublime and enchanting view imagination can conceive bursts upon the sight. The two rocky sides of the river almost uniting, compress the stream into a narrow compass, and the channel being oblique in its descent, the water is forced with unusual violence over a mass of rocks, undermined, disjointed, and fractured into a thousand different forms. At the bottom of the fall is a deep abyss, in which the wheeling waters suffer an agitation, of another kind, but scarcely less violent. The whole scene is finely shaded with trees; and to those who admire the efforts of art more than the simplicity of nature, is greatly heightened by the reflection of embossed mirrors, which almost completely cover the sides and ceiling of the hall. A natural cave higher up this river, is called Ossian's cave, from a tradition that it was the occasional retreat of the Celtic bard.

The other rivers which remain to be noticed, *viz.* the Isla, the Erich, the Shee, the Eardle, and the Dean, with the exception of the last, also present scenes of the most picturesque description, and scarcely inferior to those we have already mentioned. On the Erich, indeed, about two miles north from the village of Blairgowrie, is a scene of a peculiarly romantic character. Here, for an extent of 700 feet, both banks are 220 feet in perpendicular height, and are formed of rock, as smooth as if it had been chiselled by the hand of art, but shaded with a profusion of trees, and a great variety of curious plants.

Lakes.—Perthshire is no less fruitful in lakes than in rivers. These are spread throughout every district of the county, but are most numerous in its western division. Some of them are formed by the expanded waters of the rivers, in their course through glens, hemmed in on all sides by lofty hills; and others are formed simply by the occasional currents which pour down the mountain declivities. The principal among them, for extent and beauty of scenery, are loch Rannoch, loch Tummel, loch Dochart, loch Tay, loch Earn, loch Lubnaig, loch Doine, loch Voil, loch Conar, loch Ard, loch Monteath, loch Van-a-choir, loch Achray, and loch Katharine.

Loch Rannoch is formed by the streams of the Gawer and the Erich, and is about twelve miles long, and from one to two in breadth.

Loch Tummel is situated below loch Rannoch, on the river which bears its name.

Loch Dochart is formed by the river Fillan, the principal branch of the Tay. It is upwards of three miles in length, and is distinguished by very fine and romantic scenery, its banks being precipitous, and covered with a profusion of

trees. In this lake is one of those natural curiosities, called a floating island, also a stationary island, overhung by a huge promontory, and adorned with the ruins of an ancient castle. The stream which flows out from the lower extremity of this loch is called the Dochart. It discharges its waters into loch Tay, one of the finest lakes in Scotland, extending about fifteen miles in length, and from one to two in breadth. Its banks are beautifully winding, and diversified with wood and lawn, bold and sloping mountains. This lake has at different times, like loch Lomond, suffered violent and unaccountable agitations.

Loch Earn is the source of the river of that name, which falls into the Tay. It is eight miles and a half in length, and one and a half in breadth. For about five miles on each side its banks display a great profusion of natural oak-wood, and as great a variety of beautiful scenery as any district of similar extent in North Britain. Near each end is a small island, evidently artificial, on one of which are still seen the ruins of a castle. The mountain of Benvoirlich, at the head of this lake, is distinctly visible from the castle of Edinburgh, and from the vicinity of Loudon castle, in Airshire.

Loch Lubnaig is the lowest lake on the river Balvaig. It is above four miles in length; but is extremely narrow, "presenting the same picture with most of our Highland lakes, of a sheet of water arrested in a deep ravine, and thrown back by obstacles from the lower extremity." Such is likewise the character of *loch Doine* and *loch Voil*, which are placed higher up the same river. In the middle of loch Lubnaig is a tremendous rock, called Craig-na-Coleilg, the "Rock of the Joint Hunting," from having been the boundary between the estates of two ancient chieftains, who were wont to meet here on sporting days, and to hunt round the rock in common, after which they separated, each turning towards his own property, to denote that he was at the utmost boundary of his possessions.

Loch Conar, or *Chon*, is situated near the confines of this county with Stirlingshire, and between the stupendous summits of Ben Lomond and Ben Venue. It is nearly three miles in length, and one in breadth. In its bosom are several islets, which as well as the banks are clothed with trees and herbage.

Loch Ard lies to the east of loch Conar, and partakes of the same character of scenery, but is larger, and more irregular in its figure.

Loch Monteath, or *Monteith*, situated in the district of that name, is admired as one of the finest lakes in Scotland. It is nearly of a circular form, and measures about five miles in circumference. Its banks, which are only gently elevated, are well furnished with trees. On the north side, close to the water, stand the manse and church of Monteath, together with an elegant mausoleum, lately erected for the Garthmore family. But the most distinguished ornaments of this lake are its two islands, both of which are decorated with the ruins of ancient buildings. On the larger one are the remains of a priory, founded and endowed by king David I., which displays some fine specimens of "Gothic" sculpture. The ruins on the smaller island are those of the ancient residence of the Grahams, earls of Monteath.

Loch Van-a-choir, *loch Achray*, and *loch Katharine*, are all expansions of the river Teath. The first is about four miles in length, and the second somewhat more than one; they abound with salmon, trout, and pike, and exhibit at different points some fine and delightful views. The last, however, far excels the others in every respect, and is indeed at

PERTHSHIRE.

once among the most intertelling lakes any country can boast of; whether we consider the alternate beauty and grandeur of its scenery, or the classic charm it has derived from the creative imagination, and descriptive talents of the author of "The Lady of the Lake."

Soil, Climate, and Agriculture.—Perthshire, with respect to these subjects, is naturally divided into three districts, which differ from each other very materially. These divisions are termed the Highland district, the Lowland district, and the district of the Carse of Gowrie.

The Highland district, which comprehends by far the larger portion of the county, is included within, or rather formed by, the Grampian mountains. In relation to the whole extent of the Scottish Highlands, it constitutes what are usually denominated the Central or Southern Highlands, in contradistinction to those of Argyleshire, or the Western Highlands, and those of Invernesshire, or the Northern Highlands. It may also be regarded as the central district of the whole kingdom of Scotland, and is subdivided into small portions, marked by glens or valleys, called Rannoch, Glenlyon, Glenloch, Glendochart, Glenqueich, Glenshee, the environs of loch Tay, and Strath-Tay. Throughout this vast tract of country, contrary to what might be supposed from its northern latitude, the elevation of its valleys, and the altitude and naked aspect of its towering mountains, the climate is not less mild than in the moor-lands of Yorkshire. Indeed, the mountains of Perthshire may even claim an equality in temperature with those of Cornwall and Devonshire, and certainly surpass them in dryness of climature, excepting on the western margin of the district, where the quantity of rain which falls is immense. The soil in the valleys here consists in general of a brown loam, of uncommon fertility, lying on a sound, dry gravelly, or sandy bottom. A similar soil prevails on the sides of the hills to a considerable height, and is not unfrequently found under the black moory earth of the heaths. What is remarkable, the slopes of the mountains facing the north are much more productive than those which possess a southern exposure. This phenomenon is accounted for, by the supposition that the soil suffers more exhaustion on the south than on the north, because of the greater alternation of rain and snow, and of heat and cold, to which the surface of the former is liable, from the action of the sun-beams, and the greater frequency of southern rains. In this district few of the valleys contain large areas of free cultivable land, like those found in the south; and even the scanty areas that do exist have required in general the aid of human industry to clear them of the rocks which have been torn from the impending mountains. Yet as the glens are numerous, it happens here, as in most parts of the Highlands where modern sheep or cattle-farming is not prevalent, that each farm possesses its pittance of hill and dale, and its share of every description of land, as arable, meadow, green pasture, and moor. The arable lands have a two-fold distinction, the infield and outfield lands; the first of which, lying near the farm-yard, is kept constantly in tillage, and receives all the manure the possessor can collect; while the latter, consisting of such plots at the lower parts of the valleys, are level enough to be ploughed, are kept in corn and natural ley, or weedy wastes alternately, without the smallest assistance of manure. The wet plots in the vales are termed meadow, and kept uniformly under the scythe, for a scanty supply of hay. The faces of the "braes," the roots of the hills, the wood or rough stony wastes of the bottoms, and a small plot near the house, are generally appropriated to cattle in summer, and sheep in winter; the sheep and horses being kept in summer "above the head dyke," upon the hill or

minor lands. These are laid out, or distributed in different ways, as chance may have determined; lying sometimes contiguous to, or immediately above the pasture lands, and sometimes detached from the rest of the farm entirely. Sometimes they are appropriated to a particular farm, but are more frequently in a state of commonage.

Such is the general description of the Highland farms of Perthshire; whence it may reasonably be concluded, that the husbandry of this district is not in a very advanced state. This, however, does not arise from a want of knowledge, or even of industry, among the farmers, but from the peculiar constitution of society in the more northern portions of our island. Before it can be remedied, the farms, now in general small, would require to be increased greatly in extent, and the farmer assisted with capital, should he be deficient in means of his own. The pride of clanship among the proprietors ought to be laid aside, and the eventual interests of the country studied, instead of the misapplied philanthropy, which constitutes the ruling motive for continuing the small farm system. That useless and idle race of occupiers or sub-tenants, called acre-men or crofters, must likewise be extirpated, to facilitate the agricultural improvement of this district. For some further observation on this subject, see SCOTLAND.

The only crops raised here are oats, bear or bigg, flax, and potatoes, and on some spots pease. Wheat is never sown. The business of the flax-harvest, in particular, is well conducted. Indeed, in the management of that article, the Highlanders may be said to excel.

The Lowland district includes all that portion of Perthshire which lies to the south of the Grampians, with the exception of the Carse of Gowrie, to be afterwards noticed; viz. part of Strathmore (see STRATHMORE); and those districts of the county, the streams of which flow into the Forth, or the Earn. Along the Forth, for an extent of eighteen miles from Garthmore to the bridge of Allan, the soil of the level lands is a deep, rich clay, of various degrees of fertility. This soil, however, is still covered, for about four miles, by a tract of moss from six to fifteen feet deep, called the *Moss of Kincardine*, because situated chiefly in the parish of that name. This moss is supposed to have once covered the whole valley, and was well worthy the investigation of the naturalist. By the exertions of the late lord Kaimes, however, and by the judicious liberality of its proprietors, it now rapidly diminishes in size, and will doubtless be entirely cleared in a few years. It is wholly let out on leases of thirty-eight years, in proportions of eight acres, to different tenants, who pay no rent for the first seven years, and only one or two marks Scots for the succeeding thirteen years, and twelve shillings for each cleared acre during the last nineteen years. The number of men settled on this moss, in 1801, was 115, of women 113, boys 119, and girls 193.

In the low grounds of Strathearn, wheat is the great object of husbandry, generally after summer fallow, but frequently also after clover ley. In the upper parts of the district, barley and oats are the principal crops. The culture of flax is universal over the whole district, but is not carried to a great extent in any one place. Potatoes are raised in vast quantities on the light soils, as are likewise turnips, especially within the last ten years. Farms here vary in size, from 30 to 400 acres, and are for the most part managed upon the most approved system. The greater part of this district, however, is yet uninclosed. The manures chiefly in use here are lime and marle, of which last article there is great abundance found in the small lakes, and in the land-locked bogs and mosses.

PERTHSHIRE.

The third agricultural district of Perthshire, or the Carse of Gowrie, is situated along the northern shore of the frith of Tay. It is a long, narrow plain, and extends sixteen miles in length: it contains about 18,000 acres of extremely rich and fertile soil. This district, indeed, may be justly styled the boast of Great Britain for natural productiveness, and yields to no portion of the globe in the intelligence and skill of its farmers. Like the Delta land of Egypt, and those fertile tracts adjacent to the mouths of the Ganges, the Indus, and the Mississippi, the Carse of Gowrie has been formed in a long course of ages, and has grown rich by the spoils of the Highlands. The heavy rains which fall near the sources of the Earn, the Tay, the Tummel, the Garry, the Isla, and their tributary streams, have washed down great portions of soil, and have laid bare the rocks of the highest mountains to give exuberance to the banks of the Tay. The Carse, in fact, is evidently nothing more than what is called in other quarters sea-mud, or sleet, consolidated by time and gradual deposition. The substrata here are various, and might form a subject of curious and interesting investigation. The soils also differ. On the banks or braes of the Carse, which slope gently with a southern aspect, the soil is a hazle-coloured loam, except in the higher part of the ascent, where it is a sharp gravelly kind. In the "Low Carse," clay is the prevailing soil. Here the farms are classed into six divisions, as nearly equal as the nature of the ground will admit, and the following rotation is that most generally approved of: 1st year, summer fallow,—the land dunged; 2d, wheat; 3d, pease, or pease and beans; 4th, barley, with clover and rye-grass; 5th, clover; 6th, oats. Sometimes, however, fallow is excluded, and some green crop substituted. This happens almost universally on the banks or braes of the Carse; and on the higher grounds, the raising of wheat is only very partial, and the third, fourth, fifth, and sixth years are generally appropriated to hay or pasturage, the seventh to oats, and the eighth to barley. The climate of this district is mild, and favourable to vegetation, beyond perhaps any other in Scotland, as it is completely sheltered, on all sides, by lofty mountains, and by plantations of various kinds of trees. Farms are generally from 100 to 300 acres in extent, and are let on leases of nineteen years, at as high a rent as any field-land in Great Britain. The only artificial manure used is lime; for which nearly 2000*l.* is paid annually to the lime-works in Fife, or in England.

The *live stock* of this county consists of horses, cattle, sheep, fowls, bees, and swine, except in the Highland district, where the fow, till lately, was still a more rare phenomenon than a well-cultivated farm. The horses of this district, on the other hand, are too numerous, and almost wholly of the common Highland breed, as well as the cattle. The sheep, however, have of late undergone a considerable change, by intermixture, and are certainly improved. In the Lowland district, and in the Carse, the horses are an active, middling-sized breed; and in the latter district are many of a heavier kind, for the use of the plough in the lower grounds, where the soil is deep and heavy. Few black cattle are reared in either district, but a certain number of cows are kept by every farmer. On the Ochil hills, and in almost all the mountainous districts, sheep are reared in great abundance. They are mostly of the black-faced breed.

Woods and Plantations.—In ancient times a great proportion of this county was covered with thick forests of oak. In the mosses are found vast collections of trees, some of them of immense size, which have evidently been cut from their trunks by the hand of art, and as tradition reports, by the Romans, when they first crossed the Forth under Agrico-

la. The forest of Blackironside, on the banks of the Earn, is particularly noted in history, as the scene of many of the exploits of the celebrated sir William Wallace and his gallant followers. In the Highland district was the forest of Manlorn, now converted into sheep farms, besides other large forest tracts, which it is unnecessary to particularize, as the whole of them have been in a great measure destroyed. Perthshire, however, still contains many extensive woods, formed within the last fifty years, of which those of the duke of Athol, in the Highlands, are by far the largest and most valuable, and abound with deer and a variety of other game. Most of the gentlemen's seats in the county are also shaded by plantations. Indeed the spirit of planting has gone abroad here, with a degree of energy seldom paralleled in any country in Europe; and will, no doubt, eventually produce the happiest effects.

Civil and Ecclesiastical Divisions and Government.—Perthshire, like every other county in Scotland, is placed under the jurisdiction of a lord lieutenant or high sheriff, and a sheriff depute, who has the privilege of appointing a substitute to hold courts in his absence. The whole is ecclesiastically divided into sixty-seven parishes, of which nineteen belong to the Highlands, and forty-eight to the Lowlands. Of these, nineteen are included in the presbytery of Dunkeld, twenty-one in the presbytery of Perth, fifteen in that of Auchterarder, and eleven in that of Dunblane, all in the synod of Perth and Stirling. In this county are two royal boroughs, Perth and Culrofs, and a number of considerable towns and villages, of which the principal are, Downe, Callender, Scone, Dunblane, Comrie, Crieff, Auchterarder, Dunning, Abernethy, Dunkeld, Alyth, Cupar, Angus, Blairgowrie, and Longforgan.

Manufactures.—The grand object of manufacturing industry in Perthshire is the linen trade. Great quantities of linen yarn are annually spun by the women, and in every village are a number of weavers, who convert the produce of their labour into cloth, a great part of which is sold to the merchants of Perth, Dundee, and Glasgow, in its unbleached state. A large portion of it, however, is likewise bleached within the limits of the county, both for private use and for exportation. In the vicinity of Perth, and in other districts, are not less than eight or ten different bleach fields on a large scale.

Antiquities and Historical Events.—Perthshire displays a field of great interest to the antiquary, as well as to the historian. Lying north of the Roman wall it was the scene of many conflicts, fought in support of the last gleam of Caledonian independence in the Lowlands. From a passage in Claudian, we learn, that the Earn was frequently dyed with blood.

"Scotorum cumulos flevit glacialis Jerne."

And Tacitus informs us, that at the foot of mount Grampius, Agricola encountered and overthrew the heroic Galgacus. The precise spot on which this battle took place is not certain, but a variety of conjectures have been hazarded upon the subject, of which the most probable is that which fixes it in Stormont, where a large Roman encampment is still visible, together with a numerous collection of cairns, the indubitable memorials of Caledonian strife. At Ardoch is another encampment, probably the most perfect example of ancient castrametation in Great Britain, and near it are two smaller ones, less perfect in their construction. There is likewise a Roman encampment at Ochil, which communicates with Ardoch by a raised road, or causeway. Vestiges of a strong military earthen work are also to be traced about two miles from Monzie; and on the hill of Dummore is another

another fortification, said to have been Fingal's place of residence, after the destruction of his house in the vale by Gara. This fort is defended by a deep ditch and rampart; and is doubled walled, each wall measuring twenty feet in thickness, and consisting of immense stones piled up without cement of any kind. A similar fort, of still larger dimensions, is situated two miles eastward from Fienteach; and on the moor adjacent to it are numerous cairns and tumuli, one of which is assigned to Comhal, the father of Fingal. Near Culloquhey is a small fort, called in Gaelic, Comhal Kuils, *i. e.* Comhal's battle. At this place, tradition reports that Ossian was buried, and a stone vault, or coffin, is still visited as his. Druidical monuments are frequent in this county; such as circles, rocking stones, and single upright stones, denominated "Stones of Worship," to which the common people yet pay no inconsiderable degree of superstitious regard. Indeed some remnants of the Druidical worship may be said to linger here, as many of the Highland customs have an unquestioned reference to that religion. The first day of May, held sacred by the worshippers of the sun, continues to be distinguished by the appellation Beltan, or Baal-tein, "The Fire of Baa," and in some parts of the country is still celebrated by festivals of milk and eggs. See SCOTLAND.

In the church yard of Meigle are the remains of the grand sepulchral monument of Vanora, also called Vanera, Wanor, and Guineva, the British Helena, according to Prideaux. This princess was the wife of Arthur, but being taken prisoner by the Scots and Picts, she lived for some time, in miserable captivity, on Barry-hill. Some assert that she was one of the most abandoned debauchees of her sex; and that having been torn to pieces by wild beasts, this tomb was raised to perpetuate her infamy, and the manner of her death. The truth of his story, however, is extremely doubtful, and has perhaps arisen from the symbolic characters on the monument, most of which are of the monstrous kind, and represent various acts of violence on the person of a woman. This tomb is described in Pennant's Tour, and the description is accompanied by several plates. See VANORA.

Religious houses were frequent in this county, some of which still exhibit some fine specimens of ancient architecture. At Culross are the ruins of a Cistercian abbey, founded in 1217 by Malcolm earl of Fife. (See CULROSS.) And at Scone was a celebrated Augustine monastery. (See SCONE.) The cathedral of Dunblane stands on an eminence above the town; and part of it is kept in repair as the parochial church. (See DUNBLANE.) That of Duakeld is one of the finest piles of ancient buildings in Scotland, and is now undergoing a thorough repair. It is of mixed architecture, having been erected at different periods. (See DUNKELD.) The other religious houses in the county were the following.

Abernethy priory, founded A.D. 1273, for monks of the Augustine order.

Elcho nunnery, the Cistercian order, date of foundation uncertain.

Inchaffray abbey for Augustine canons, founded A.D. 1200.

Inch-Mahome abbey, also Augustine, date uncertain.

Perth. Cistercian nunnery, dedicated to St. Leonard, 1296.

Perth. Methven llege church, 1433.

———. Monastery vallis virtutis, for Carthusian monks,

1429.

Perth. Dominican convent, founded 1231.

———. Convent ervan, founded 1460.

Strathfillan priory in Breadalbane, founded by king Robert Bruce for reclus of the Augustine order.

Loch Tay priory, likewise Augustine, founded by Alexander I., A.D. 1222.

Suggeden hospital on Tay, founded ante 1296.

Tullibardine college church, founded 1446. See TULLIBARDINE.

Tullilum Carmelite convent, founded A.D. 1262.

Castles, Palaces, &c.—Perth, Scone, and Abernethy, having been early royal residences, were each adorned with stately palaces, which are now entirely demolished. Those of the two first mentioned towns fell a prey to the fanatical fury of the reformists. Many castellated mansions, however, yet exist in different districts of the county, and would be well worthy of description, would our limits allow. The most remarkable among them are castle Campbell, Finlanrig castle, castle Comrie, Doune castle, Ballumbri castle, Garth castle, Elcho castle, Kinnaird castle, Gowrie house, Murthly house, Kinfaun's castle, Macbeth's castle of Dunfinnan, Hunting tower, or Ruthven castle, Balloch castle, the residence of lord Breadalbane, Blair castle or Athol house, and Drummond castle. Some of these are in ruins, and some have been so much modernised as to alter in a great measure their original appearance. Beauties of Scotland, vol. iv. Sketches of Perthshire by the Rev. P. Graham, D.D. Edin. 1812, 2d edit. 8vo.

PERTI, GIO. ANTONIO, in *Biography*, a solid, grave composer of church music, *alla Palestrina*, was born in 1656. With his theatrical style we are unacquainted; but as he long continued to be employed, not only for the operas of Bologna, but Venice and other cities of Italy, we may reasonably imagine that it was excellent. Paolucci has printed a good duet by this master, in the church style; and Padre Martini has given several admirable specimens of his science in his "Saggio di Contrappunto." This great harmonist, however, does him still more honour, by calling himself his disciple. Perti, before his decease, must nearly have attained the age of 100; for his name appears as the composer of *Atide* in 1679, and, according to Quadrio, he was living in 1744.

PERTICA, in *Astronomy*, a sort of comet, being the same with *veru*.

PERTICA, among the Romans, a long rod for beating the fruit from trees. It was likewise used for a long measure. See PERCH.

PERTICATA, or PARTICATA *Terre*, in our *Old Law Books*, is the fourth part of an acre, or a piece of ground containing one perch in breadth, and forty in length. See ROD, and PERCH.

"Continet in integra superficie 40 perticas."

PERTICI, in *Biography*, a comic singer and admirable actor, came hither in 1748 with Larchi, another excellent comic singer and actor, and Guadagni for the first time, when he was very young, as serious man in a troop of burletta singers, brought over upon speculation by sig. Croza, whose calculations were so erroneous, that he became a bankrupt and a fugitive in a year's time.

PERTICULAS, poor scholars of the isle of Man. The king granted to "L. Mauguin de insula de Man, scholari, quandam eleemosynam vocatam Peticulas, ad sustentationem cujusdam pauperis scholaris, de insula predicta ad exercend. scholas, per progenitores nostros quondam reges Angliæ datam et concessam." Pat. Hen. IV.

PERTIGI, in *Geography*, a town of the island of Sardinia; 19 miles S.E. of Castello Aragonese.

PERTINAX, PUBLIUS HELVIUS, in *Biography*, a Roman emperor, was born in the reign of Adrian, A.D. 126.

His

His father was a freedman, by occupation a maker of charcoal; but notwithstanding his humble condition, he took care to give his son a literary education. The young man first employed himself in teaching at a grammar-school, but dissatisfied with a sphere that gave no hope of advancement, he entered into the army, and served as a common soldier in Syria. He soon obtained considerable rank, and at length the government of the two Mærias was committed to him, and afterwards that of Syria, which he held till the accession of Commodus, in the year 180. Upon this event he returned to Rome, where he passed three years in retirement. During this period he employed himself in embellishing his native place with several elegant buildings; but he permitted his father's house and shop to remain unaltered, as a memorial of his humble origin. He was now sent by the emperor into Britain, where the legions were in a state of great disaffection and indiscipline. The soldiers would very willingly have transferred their allegiance to Pertinax, but he preserved his fidelity inviolate, and incurred much personal danger in quelling the mutinous spirit of the troops. At length he was recalled, and appointed to the important trust of superintending the supply of Rome with provisions. After this he was made proconsul of Rome, twice a consul and governor of Rome. Pertinax was in possession of this last office, when the tyranny of Commodus brought his detestable reign to an end; and he succeeded to the imperial purple, by an apparently free election. All the measures of his short reign were directed to the public good. He found the treasury empty, which he replenished by a public sale of all the articles of prodigal luxury which he found in the palace. He himself adopted a frugal and simple mode of living, and by it, which has been condemned as the meanest parsimony, he was enabled to abolish many oppressive taxes, and he shewed a great disinterestedness and disregard to the accumulation of wealth, by declaring that he would accept of no legacies from persons who left children or other lawful heirs. He discouraged all informations for treason, and administered justice with equal mildness and impartiality. Such a course of conduct was not likely to please those who had profited from the vices of Commodus; and plots were soon formed to subvert the new government. While Pertinax was absent at Ostia, an attempt was made to raise to the throne the consul Falco. He hastened back and com-

plained of the fact before the senate, but when that body proposed to condemn Falco as a traitor, he declared that no senator should suffer death in his reign, and dismissed him in safety. A spirit of mutiny was by false representations excited among the guards, and three hundred of them proceeded with drawn swords to the palace. The emperor's officers and friends sought for safety by flight, but Pertinax disdained even to conceal himself. He appeared before them with a firm and intrepid air, and expostulated with them upon their conduct, which made such an impression on the minds of the conspirators, that they began to sheath their swords. At this critical moment a Tungrian soldier threw his javelin at the emperor's breast, and the feeling of respect being thus dissolved, the rest rushed in, and dispatched him with many wounds. When he saw that his fate was inevitable, he wrapt his head in his toga, and fell without a struggle. This event took place on the 28th of March 193, after a reign of only three months. Electus, and some other of his attendants, who attempted to defend him, were also slain; his son and daughter only escaped, who happened at the time to be out of the palace. From the number of his adventures, he was called the tennis-ball of fortune, and no man experienced so many changes in his life, with so blameless a character. His character is highly spoken of by contemporary historians, and his memory was highly revered by the Roman people.

PERTISTEGNO, in *Geography*, a town of Italy, in Friuli; seven miles N.N.W. of Friuli.

PERTUIS, a town of France, in the department of the Vaucluse, and chief place of a canton, in the district of Apt; 12 miles S.S.E. of Apt. The place contains 4000, and the canton 12,601 inhabitants, on a territory of 337½ kilometres, in 14 communes.

PERTUIS *d'Antioch*, a strait, or narrow part of the sea, between the isle of Oleron and the isle of é.

PERTUIS *Breton*, a narrow strait of the sea, between the isle of Ré and the coast of France.

PERTUIS *de Maumussou*, a strait between the isle of Oleron, and the coast of France, S. of the island, about one mile wide.

PERTURBATION *of the Planets, &c.*, in *Astronomy*. See PLANETS, MOON, SATELLITE, and SOLAR SYSTEM.

END OF VOL. XXVI.

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